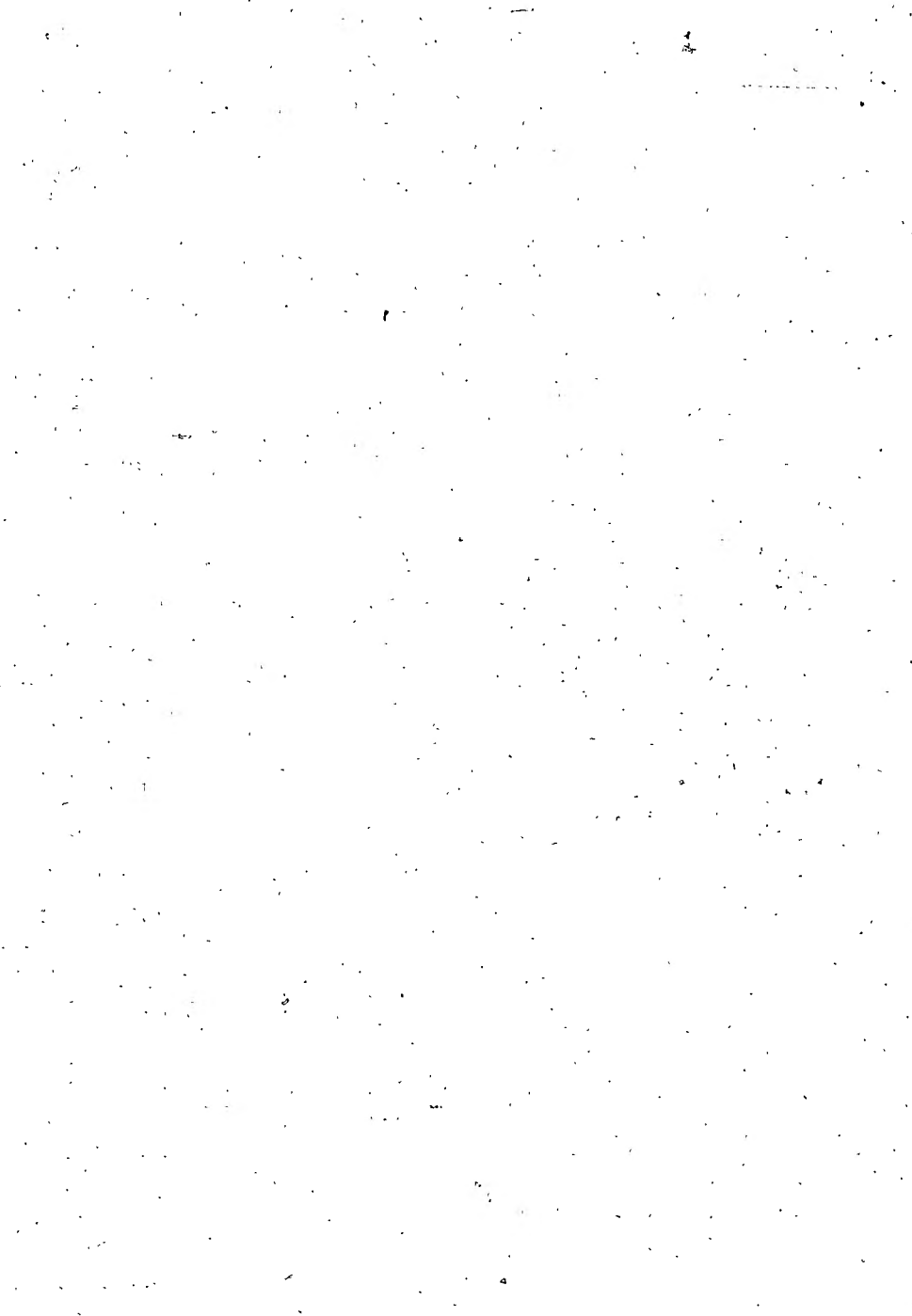




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The Story of Wheat

ALBERTA WHEAT POOL
CALGARY, ALBERTA, CANADA

APRIL - 1940

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Copies free on request.

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AGRICULTURE, MOTHER OF ALL WORLD CULTURE

Agriculture is the basis of all civilization. This fact is attested by the experiences of human history. Agriculture is also the mother of all culture because it is the method of living that marked the beginning of the emancipation of mankind from complete dependence upon Nature, and her domination of the human intellect.

As far back as anything is known about civilization the cultivation of the soil has been the first and most important industry in any organized state or nation. Where neglected, agriculture declined and the state degenerated as a direct result.

Herodotus, father of history, in his relation of the story of the human race in the Valley of the Euphrates, tells of a prosperous agriculture supporting a populous region in the ancient days. With good cultivation, he said, a return of two hundred fold was obtainable from the soil. That was the garden of the world in its day and its great cities included Babylon and Nineveh. But agriculture fell into decay and so did civilization. In place of the multitudes of humanity that once populated the Valley of the Euphrates, there are now a few wandering Arab tribes. Piles of desert sand mark where the cities once stood.

The Promised Land, the land of Canaan, itself, to which the Children of Israel were brought up from Egypt after forty years wandering in the wilderness, was then a land flowing with milk and honey, according to Moses. When its agriculture fell into decay the region degenerated into a wilderness, capable of supporting only a nominal population on a very low standard of living.

It is made clear by every process of logic and by the proof of historic fact that the wealth of a nation, the character of its people, the quality and permanence of its institutions, are all dependent upon a sound and sufficient agricultural foundation. Not armies, or navies, or commerce, or diversity of manufacture, or great distributive systems, or anything other than the farm, is the anchor which will hold through the storms of time which sweep all else away. In the words of a wise philosopher, the farm is "the best home of the family, the main source of national wealth, the foundation of civilized society and the natural providence."

THE ORIGIN OF WHEAT

The beginning of agriculture marked the beginning of civilization. It defined the transition period from the hunting, nomadic era of the human race to the settled stage of society — settled in location. If the soil is to be tilled, seed is to be sown and crops to be harvested, a wandering tribe must establish itself.

Where then in the history of this old world did agriculture begin?

Most of the literature of man's social ascension holds that farming began in the tropical lowlands, and this for the reason that little manual labor was required in a soil lush with vegetation. Karl Marx disputed this, holding that the great achievements of man are the result of strenuous collective effort. He suggested that a search for the origin of farming should be conducted not in the low, warm countries, but in regions where plants could not be cultivated without hard work.

A few years ago Professor N. I. Vavilov, the distinguished Russian geneticist, strikingly confirmed the Marxian suggestion. Vavilov, it should be understood, is one of the leading geneticists of this modern age, a man who has cultivated cereal plants by the thousands and traced them to their original homes. He came to the conclusion that in primitive times farming

reached its highest development in mountainous regions and in the deserts of Egypt and Peru. Raids and wars drove beaten tribes to the highlands where agriculture could be developed in peace. Hence its mountain origin.

In his book, "Age and Area," Willis makes the point that the longer a group of plants has been established in a given area the more species will be found there. Hence, diversity is a clue to place of origin. Wheat, for example, is an Old World plant. More varieties are found in Asia and Europe than in the Americas.

Vavilov bred grains back to their primitive forms and then looked for regions where the primitive forms were still to be found, either wild or cultivated. He traveled hundreds of thousands of miles, sent expeditions to every country in his efforts to trace wheat to the region of its origin, and collected more than 31,000 strains which he planted and cultivated. After studying all the material he concluded the first farmers must have lived in the highlands of Southern Asia, Central and South America, and Southern Mexico. In Southern Asia farms are to be found 12,000 feet high in the Himalayas and at 10,000 feet in Afghanistan. In Tibet, on the shores of Lake Dengra-yun, the soil is filled at an elevation of 15,000 feet above sea level — a record unsurpassed in agricultural history.

To explain how Vavilov undertook to discover the home of wheat requires venturing into the genetic field. The genes are the units of heredity and a group of these make up the chromosomes. It occurred to Vavilov that if he gathered enough wheats and other cereals to establish the number of chromosomes in each strain, he could determine the original home of wheat. It turned out that there are two principal varieties of wheat, one with 42 chromosomes, and the other with 28. Each originated in a definite region and the two can be crossed only with difficulty. The 42 chromosomes type came from Southwestern Asia and the 28 chromosomes type from Ethiopia. Vavilov discovered that more varieties of wheat are to be found in Ethiopia than in all other countries combined. He arrived at the conclusion that the highlands of that ancient nation, now an Italian colony, were the home of wheat, and that Egypt got her agriculture and civilization from the erstwhile kingdom of ex-emperor Haile Selassie.

WHEAT FAVORED BY CIVILIZED NATIONS

Wheat is the bread grain of the civilized races. There is a constant urge among all peoples to adopt the manners and customs of those who are considered socially superior. Wheat, then being expensive, was at first eaten only by the rich and its use came quite early to be a mark of aristocracy. With increasing purchasing power the poorer classes have been able to remove the social stigma attached to the eating of coarse bread.

Another factor which created a greater appeal for wheat eating is that wheat bread is more palatable to most people than breads made from other grains. The wheat flour protein known as gluten exhibits the property of becoming viscid upon the addition of water. The viscid substance or dough, when mixed with yeast, ferments and "rises," forming a light porous mass which, when baked, becomes the bread of our day. The proteins of barley, rye and oatmeal fail to become viscid with water and are therefore unsuitable for bread making. The gluten of barley possesses a less tenuous quality than that of wheat and consequently is not so satisfactory.

Then the whiteness of wheaten bread makes it attractive. With the march of progress from primitive to modern conditions there is an increasing demand for bread that is white. Of all flours or meals derived from cereal grains that from wheat makes the whitest bread. In the pursuit of this whiteness the processes of modern milling have been so elaborated as to remove everything that may impart a dark color to bread and so detract from its appearance.

A few years ago it was estimated that the number of wheat eaters in the world was 585 million. Even in India, Japan and China, where rice and millet are the principal food grains, there has been an inclination to an increasing consumption of wheat. The principal factor restricting this trend in those countries is the poverty of the people.

Immediately prior to the Christian era the chief food grain cultivated in Greece, Italy and in other countries bordering the Mediterranean, was barley. With the gradual spread of wheat from its original home in North-east Africa and Asia there came a growing recognition of its superiority among cereals. In the Graeco-Roman period wheat occupied an important place in the economy of advancing civilization as the food of the richer classes. In the Rome of Cicero's day barley was considered fit only for barbarians and slaves, the free citizens spurning all cereals except wheat. Similarly in early Britain, where the principal native crop was oats, the Roman conquest brought about a trend towards wheat cultivation and Britain became one of the principal wheat exporting countries of the Roman Empire.

The Chinese used wheat as a food five thousand years ago. Wheat was cultivated along with millet, and barley by the original Swiss lake dwellers and by Scandinavian stone age men. Emmer, the primeval wheat, entered into the food of pre-dynastic Egyptians.

Looking back along the centuries the gradual change in cereal cultivation in Europe is discernible with wheat gaining supremacy over competitive grains. Today in Europe there are only two areas where cereals other than wheat occupy a position of any importance as human dietary elements. In Northeastern Europe considerable quantities of rye are still consumed and in the Danube Basin maize is still utilized in the making of bread.

Notable scientists maintain that wheat, barley, oats and rye are superior to maize and rice because of the quality and quantity of their protein and the amount of mineral matter they contain, but there is not such abundant evidence from a scientific standpoint to prove that wheat is very much superior to barley, oats or rye from a nutritional standpoint. It is a test of color and the added prestige of being a wheat bread eater that weighs the balance in favor of wheat.

Then there is the highly debatable point as to the value of whole wheat flour as compared with the highly milled and refined product. It is on the alleged superiority of the whole wheat flour that so many food fads have been developed. The truth would seem to be that the vitamin potency of the whole grain is not transferable to the extracted refined flour. But wheat is primarily a fuel food and the nutrition extracted by milling the grain is more than made up by the milk, fruit and vegetables which form such an important part of the diet in modern standards of living.

That there will be a constantly extending use of wheat flour among all peoples of the world is the main hope of the large wheat exporting nations. If such a trend persists and if continental European nations find it to their advantage to let their people have good imported wheat at world prices, there will be no reason for the future piling up of unwieldy surpluses.

PROGRESS OF FARM MECHANIZATION

New vistas are ahead for agriculture and the farms of the future will be mechanized to an extent never dreamed of today. The world has come a long way since some primitive savage stirred the ground with a sharpened piece of stone or a stick and found that in so doing nature could be induced to produce more lavishly. When the abundance of nature required some artificial stimulation, man began his first scientific farming experiments. Among the established recorded improvements in tillage equipment is one taken from an early mural — a crooked stick is shown with a reverse curve like the letter "V" with one end elongated and the short end sharpened for penetration.

As generations passed mankind improved his cultural practices. In the year 1100 B.C., as recorded in the Scriptures, "The Israelites sent down to the Phillistines to sharpen every man his share and coulter." Then a long step forward was taken when beasts of burden were domesticated and taught to pull the plow. One man with an ox-drawn plow could produce as much as three or four men could produce before.

The Roman plow, invented in the early years of the Roman Empire, had a point made of two pieces of wood meeting at an acute angle and being plated with iron. This plow was probably the first one that inverted the soil. Pliny, a Roman farmer, prescribed "the first plow should be nine inches deep," and stated further that "the Etruscans sometimes plowed their stiff clays as many as nine times."

Centuries later, the Dutch invented a better plow and some of these were imported into England in 1730. Small, a Scottish inventor, improved the plow, making it almost entirely of iron. In 1803, Robert Ransome of England secured patents on an improved case-hardened, cast-iron share.

The nineteenth century saw tremendous advancement in plow making. As the North American west was opened plows were developed that would scour cleanly. John Deere, an Illinois blacksmith, brought out a steel plow with a curved mould board. In 1875 the John Deere Plow Works turned out the first sulky plow, and in 1898 a high-lift, two-furrow riding gang plow was introduced.

The early years of the twentieth century saw the advent of the steam tractor. The present generation know to what extent the internal combustion engine has revolutionized and perfected the tractor.

There are more than 25,000 tractors operating on Alberta's 100,000 farms, more than 3,000 combines, about 8,000 motor trucks and over 40,000 automobiles. Each passing year sees a greater degree of mechanization in rural Alberta. The same trend is manifesting itself throughout all Canada, the United States, the U.S.S.R., Argentina, Australia and even in Europe. The older sections of each country, where farm holdings are smaller, are slower in mechanizing their agriculture, but the perfecting of small, sturdy, cheap tractors furnishes a strong inducement to abandon horse power.

The decline in the number of horses and mules in Western Canada in the past decade and a half has been about a half a million. In the United States in the past twenty years the decline in the use of horses and mules has been about ten million. This trend brings up another problem, for as horse and mule numbers decline, less land is needed to produce fodder. It is calculated that between thirty-five and forty million acres in the United States have been diverted from the production of horse and mule fodder into wheat growing and the production of other human food. More and more, the faithful and diligent horse will be relegated to the background, and fast, efficient and economic machines take its place.

Gradually, the back-breaking manual labor is being relieved from agriculture by the machines. This is not at all displeasing to the farm youth. In fact, mechanization provides an attraction for a young man to stay on the farm. The younger generation is more mechanically-minded than the older, and the ease and speed with which machines do the work appeals strongly to them.

SCIENCE AND WHEAT GROWING

Ancient peoples who grew wheat for food did not have the advantage of groups of highly trained scientists to explore the processes of nature and to show the way in improving agricultural practices. These primitive farmers, however, had sufficient intelligence to select the better and stronger plants from which to obtain seed for future sowings. To those dawn age people modern civilization owes a debt of gratitude for selecting, propagating,

and thus perpetuating, the better kinds of crop plants which constitute the heritage from the agricultural past.

While the selective process must have taken slow centuries in ancient times, modern day science can accomplish seeming miracles in a comparatively brief period of time. Highly skilled cerealists and bio-chemists have penetrated the innermost secrets of the wheat plant and know its characteristics as well as the behavior of their own children. This fact, combined with the contribution of the engineer has made to the physical aspects of farming, and the skill developed by flour millers, has made the production of bread a highly perfected process from the time the seed is sown in the ground until fresh loaves are turned out from the bakery.

In the menu of mankind there is no food so complete as bread. The consumption of a pound of wheat a day will provide 40 per cent of the average requirements of 3,000 calories required in an average diet, according to Dr. McCallum. He states: "In my opinion, the diet should consist of about 40 per cent wheat flour, 20 per cent of dairy products, daily servings of leafy vegetables and an adequate supply of fruits."

The wheat plant stores up nutrition in the small grain of wheat in a mysterious and complex manner. Thirty days before harvest the plant flowers and begins the formation of the grain. The sack, or envelope, which eventually will become the "bran" of the grain is the first produced. Into this is loaded the germ, or embryo, and the endosperm, or starchy food reserve. Protein materials and minerals that have been accumulated and stored in other parts of the plant pour into the branny sack. The green parts of the wheat plant manufacture sugar which is turned into starch in the grain.

As the wheat plant doffs its summer green and assumes a tinge of yellow the protein-forming materials present are rapidly built into gluten, which forms the basis of flour. The kernel of wheat is then complete for natural purposes. Here is where man steps in.

The milling of wheat in the early centuries of the human race was a primitive process. The Bible in a number of places refers to "the upper and nether millstones," which constituted the flour milling equipment in those days. Gradually milling processes were improved and refined. It was, however, only within the last sixty years that the modern roller method of flour milling was perfected.

The success of wheat growing in Western Canada actually is an outgrowth of the development of roller milling. Prior to that time winter wheat was preferred because spring wheat flour was usually of a dark and inferior grade. From the sixteenth century to near the close of the nineteenth winter wheat commanded a higher price than spring wheat, but with the improved methods of milling, spring wheat proved to be better suited to grinding than winter wheat for, being harder, it yielded a greater percentage of middlings. Under the old process of milling this had been a great disadvantage where the purpose was to get flour, and not middlings, at the first grinding. All unpurified middlings are ~~lost~~ and when re-ground they produce a low grade of flour. When the purifier remedied this difficulty the best grade of flour was made from the middlings, and almost at a single bound, spring wheat took front rank as a flour producer. The winter wheat flour became second grade instead of being the best.

Thus the contribution of the scientist and the engineer can be traced down the centuries. The first was the crude efforts of the "dawn" farmer to select the best species to propagate, down to the cerealist of modern times with infinite resources of knowledge at his command. Second was the evolution of the plow from the crooked stick of the first farmers to the development by engineers of the extremely efficient machinery of 1940. Third was the vast improvement in flour milling from grinding between two roughly formed rocks to the intricate, elaborate and efficient method of modern flour manufacture.

It may be seen from this summarization that the agriculture of Western Canada has followed a long road.

RAINFALL AND WHEAT

It has been calculated that it requires an average of 10 tons of water, or 200 barrels, to produce one bushel of wheat on summer-fallow land. One inch of water over an acre is equivalent to 113 tons of water. Each inch of moisture available to a growing crop has resulted in an average yield from summer-fallow land of 2.84 bushels. Thus 10 inches of rainfall available to a wheat crop on summer-fallow should produce 28 bushels of wheat to the acre. But that statement is only relatively true. Timeliness of rainfall is very important and there are other factors such as wind and heat which takes an enormous toll of moisture from the soil through evaporation. Chinook winds are very dry, containing only about 15 degrees of humidity at the ground. Such winds, blowing for a few days, dry out the land to an alarming extent. Other countries with a more humid atmosphere can get by with average rainfall because the moist air does not capture any large amount of moisture from the ground. Germany is a striking example of this.

As to the timeliness of rainfall a comparison of the years 1914 and 1915 furnishes an outstanding instance of what is liable to happen in the west. In one census division of the southern prairies in 1914 the yield was two bushels of wheat to the acre on all the land under cultivation, and the rainfall for the year was 12.53 inches. In 1915 the rainfall for the year was 16.30 inches, about 3½ inches more than in 1914, yet the yield in this district was 31 bushels to the acre. In 1928, when Western Canada produced its all-time record crop of 545 million bushels, the rainfall in Saskatchewan, which produced 321 million bushels, was around 12 inches. These statistics demonstrate the urgent need of timeliness in rainfall to produce a good wheat crop. About eight inches of rain, falling between the 24th of May and the 15th of July, with the downpours coming at intervals of from one to two weeks, will produce a good crop of wheat on summer-fallow which has carried a fair reserve of moisture from the preceding year.

The main reason for summer-fallowing land in this country is to store moisture. By this method two years' moisture is made available for the crop. Fallow land is cultivated to prevent weeds growing and absorbing the moisture. Weeds take a heavy toll of moisture if allowed to grow on summer-fallow or competing with growing crops. Every weed means a reduction of crop yield because grains can utilize all the moisture in the land. During the growing season each year, deep beneath the ground, constant warfare is waging between the root systems of grain and weeds. The wild mustard plant has a root system of around 4,000 linear inches as against 2,000 for Marquis wheat. Hannchen barley has a root system of 4,674 linear inches. This extensive root system shows why barley is more successful than wheat in combating weeds.

The weather history of this country shows that dry years and wet years come in irregular series. From 1885 to 1895 there was a period of eleven dry years, the lowest rainfall of that period being 5.47 inches in 1886, and the highest rainfall being 11.98 inches in 1888. This was followed by seven years of ample rainfall from 1896 to 1902, during which time the minimum annual rainfall was 13.68 inches and the maximum 22.28 inches. From 1903 to 1910, an eight-year period of dry years occurred, in only one year of which the precipitation exceeded 9.9 inches. A wet period occurred from 1911 to 1917, the exception being 1912 when only 9.7 inches of rain fell. From 1918 to 1924 rainfall was under 12 inches each year except in 1921 and 1923, when slightly more than that fell. Satisfactory moisture occurred from 1925 to 1928. From 1929 up until 1938 a prolonged dry spell occurred, an exception being 1932. The year 1938 provided fair moisture, and rains in 1939 were heavy and widespread.

Agriculture is a continual struggle with nature and this is particularly true with farming in pioneer countries. Here in our own prairie land our wealth comes principally from agriculture and consequently all of us should have an intelligent interest in what is going on in the farming regions. The weather affords our farmers the most vexing problem of all.

WORLD WHEAT ACREAGE

In an address delivered to the Bracken Conference in Winnipeg in the late autumn of 1938, Dr. C. F. Wilson of the Canadian Bureau of Statistics, gave the world wheat acreage as 286 million for that year. This figure excluded Russia and China, reliable statistics not being available for those two countries. It is probable that Russia seeds around 100 million acres to wheat each year, and China around 50 million acres. This would make a total world wheat acreage of 436 million.

The world wheat acreage thus constitutes an area of one per cent of the total land surface; $6 \frac{2}{3}$ per cent of the potential arable and pasture land of the earth; 12 per cent of all the land where conditions are such as to permit wheat cultivation; and $18 \frac{1}{2}$ per cent of the arable land now utilized.

The acreage seeded to wheat throughout the world each year covers a larger area than any other crop sown and harvested by man. Wheat probably occupies an area about double that devoted to either of the next most important occupiers of land, maize and rice.

A little more than one-third of the world's wheat acreage lies in Asia; a little less than one-third in Europe; not quite one-fourth in North America; and only one-eighth of South America, Africa and Australia. The Northern Hemisphere contains about 90 per cent of the world wheat acreage and the Southern Hemisphere only about 10 per cent. The Western Hemisphere contains about 30 per cent of the total and the Eastern Hemisphere 70 per cent.

Soviet Russia ranks as the leading country with reference to wheat acreage, with approximately 100 million acres seeded annually to that cereal. The United States comes second with around 80 million acres. China is third with 50 million acres. India ranks fourth with 35 million acres, Canada fifth with 26 million acres, Argentine sixth with 20 million acres, and Australia seventh with $14 \frac{1}{2}$ million acres.

World wheat acreage tends to concentrate in several belts. There are seven major wheat belts, outlined as follows: One, the central plain of the United States and Canada; two, Southwestern Europe and North-western Africa, including France, Italy, Spain and the French dependencies in North Africa; three, Southeastern Europe and Central Asia, the huge belt moving east and north from the Danube Valley along the Black Sea and far into Central Asia; four, Northwestern China, mostly in and between the valleys of the Yangtze and Yellow rivers; five, Northwestern and Central India, largely in the valleys of the Ganges and Indus rivers; six, the eastern and Central part of Argentina; and seven, the southern fringe of Australia. These seven major wheat belts contain more than 80 per cent of the world wheat acreage.

The great bulk of world wheat acreage is winter wheat acreage; wheat sown in the autumn and harvested the following late spring or summer. The spring sown wheat area of the world approximates from 100 to 110 million acres, or less than one-quarter of the total wheat acreage. Of this amount, about half lies in Russia and most of the other half in the United States and Canada, and particularly in Western Canada. Spring wheat occupies over 90 per cent of the total wheat acreage in Canada, about 65 per cent in the U.S.S.R., and about 30 per cent in the United States.

Wheat yields on an acreage basis average from 5 bushels to 43 bushels. The lowest yields are in Northern Africa in regions of desert-like conditions, and the highest in Denmark and the Netherlands (43 bushels to the acre). The general average of the world runs about 14 bushels to the acre and does not vary much from year to year. The Canadian average is 16 bushels and the United States 12.2. The Alberta average is approximately 18 bushels to the acre. The Australian average is around 12 bushels and the Argentinian about the same.

Canada's role in world wheat trade lies in supplying high quality strong spring wheat. Her chief competitor in this field is Russia. The United States is third in the production of spring wheat, but uses virtually all of this type of grain for domestic purposes. Russia's spring wheat is sold on a sample basis, is not cleaned as carefully as Canadian wheat, shipments are irregular from year to year, and the quality of the exported wheat as a rule is not as high as that of Canadian exports. In wartime Russia's wheat can be shut off from world markets quite readily by an enemy power because her wheat ships must go through the Dardanelles.

WHEAT GROWING IN CANADA

Wheat growing was undertaken for the first time on the North American continent in 1605 at the little French settlement established at Port Royal, now Annapolis, in Nova Scotia. That was 113 years after the discovery of the new world by Christopher Columbus. In 1616 Champlain, a noted French explorer, recorded in his memoirs the fact that excellent wheat was produced at Quebec for transportation to France. The average yield secured by the early French settlers was a little better than 11 bushels to the acre. Wheat production formed an important part of the agriculture of Lower Canada (Quebec) for generations. By 1734 the wheat yield of the colony was 738,000 bushels.

After Great Britain acquired Canada, settlement extended westward into Ontario, then known as Upper Canada. Wheat was the staple crop of the farmers, and in 1860 that province's production reached 24½ million bushels. That is a larger wheat crop than Ontario raises on the average in modern times. As industrialism developed in Ontario and Quebec the demand for other farm products, such as meat, wool, vegetables and dairy and poultry products, enlarged, and wheat growing declined. The settlement of the west and the expansion of wheat growing in the prairie provinces also aided in the contraction of wheat production in Eastern Canada.

The first settlers who came to Western Canada arrived in Manitoba in 1813 from the highlands of Scotland. The colonization scheme was conducted by Lord Selkirk, and history records the colonists as the "Selkirk Settlers." The colony suffered terrible hardships and their attempts at agriculture saw crops destroyed by frost and plagues of grasshoppers. They persisted in the face of adversity and gradually other settlers came to people the empty land. By 1875 the establishment of trade routes, the introduction of hardier varieties of wheat and improvements in flour milling processes, opened a new era for Western Canada. By 1878 the St. Paul-St. Boniface Railway extended into Manitoba. In 1883 the Canadian Pacific Railway line was completed between Winnipeg and Port Arthur, and two years later the railway was extended to the Pacific Coast. The first wheat shipment from the west was made in 1876 and was sent to Ontario to be used as seed. It brought a price of 85c a bushel and the freight to Toronto was 35c. The first shipment of wheat from Western Canada direct to Great Britain was made on October 17th, 1877. The grain was floated down the Red River to St. Paul, Minnesota, and then sent by rail to the Atlantic seaboard. The first wheat to be shipped overseas by an all-Canadian route went out in 1881. It was freighted to Port Arthur by rail and thence by water and rail to the seaboard. There it was placed on an ocean steamer and taken to Glasgow, Scotland.

An outstanding contribution to the development of the wheat industry in Western Canada was the introduction to the prairies of Red Fife wheat. Red Fife was introduced to Canada by David Fife, a farmer located near Peterboro, Ontario. Fife requested a friend in Glasgow, Scotland, to send him some seed of wheat from Northern Europe. A cargo of wheat from Danzig was in port and a sample of this was sent to David Fife. This grain was planted in the spring of 1842 and one kernel sent up five heads

and the rest did not mature. A wandering cow ate two stems of the wheat plant, but Mrs. Fife chased her away and saved the other three. That seemingly trifling act changed the whole destiny of Western Canada. The seed from the three remaining heads was carefully preserved and soon there was a fair quantity of the wheat available. The variety proved to be a sturdy grower and a good yielder of grain of good milling and baking qualities.

The acreage and popularity of Red Fife spring wheat spread throughout Ontario. At that time many young farmers from that province were migrating into the western states and some Red Fife wheat was taken along. It is claimed that the spread of wheat growing on the prairies of the United States mid-west and the development of the flour milling industry in such great cities as St. Paul and Minneapolis was directly due to the introduction of Red Fife.

In due course of time Red Fife was introduced into Manitoba and from the very start it proved superior to any other variety that had been tried on prairie soil. Its tendency to lateness in maturity was its biggest drawback. To overcome this defect Sir Charles Saunders, then Dominion Cerealist, crossed Red Fife with Hard Red Calcutta from India and developed Marquis wheat. Marquis wheat ripens from six to ten days earlier than Fife and its introduction in the west extended the wheat area by millions of acres. Marquis proved to be of excellent quality and even today it is accepted as the standard wheat of Western Canada.

The average time for Marquis wheat to mature under average conditions in the central plains is 107 days. There was a demand for wheat that would ripen in a still shorter period. This arose along the northern fringe of the western wheat belt and also in the highlands approaching the foothills of the Rockies. Three outstanding varieties were developed as a consequence, namely, Red Bobs 222, which ripens in 101 days; Reward wheat in 99 days, and Garnet wheat in 97 days. These are average figures for the middle prairies. In the north ripening periods are longer, and in the far south shorter.

Red Bobs 222 is a selection of Early Triumph, made at the University of Alberta and first distributed about 1925. Early Triumph was a cross between Bobs, a white Australian variety, and Early Red Fife. This wheat has proven to be a high quality variety throughout the wheat growing areas of the west where rust does not occur. It becomes starchy when grown in Northern Alberta.

Reward is a result of a cross between Marquis and a very early-maturing variety, Prelude, made at the Dominion Experimental Farm at Ottawa. It is an excellent wheat of the northern type, consistently higher than Marquis in weight per bushel, protein content and in loaf volume. When grown in the northern parts of the prairie provinces it frequently produces grain of immature cast, which causes it to be lowered in the commercial grades. It is susceptible to rust and smut. In Alberta rust has never proved a menace such as it has in Manitoba and Saskatchewan. Reward frequently yields less than other favored varieties.

Garnet wheat is the result of a cross made at the Central Experimental Farm, Ottawa, between two Ottawa varieties, Preston and Riga. It proved an excellent wheat for the northern and foothills regions, ripening early and yielding lavishly. However, the grain exhibits somewhat different milling characteristics than Marquis, requiring to be conditioned differently for best results. Its flour has a yellow tinge which makes it unpopular with Canadian millers, while overseas millers dislike its admixture with the Marquis types of Canadian wheat. It was finally decided to grade Garnet wheat separately from Marquis types and ever since then Garnet has been selling at a price discount and acreage has been decreasing year by year. The northern areas of Alberta and Saskatchewan, where Garnet is most suited, are not conducive to the production of high quality wheat, and under these conditions, the poorer baking strength of Garnet as compared with Reward is accentuated.

THE WHEAT REGION OF THE WEST

Western Canada's farm lands lie between the Ontario clay belt and the Rocky Mountains, a distance of about 800 miles. The region is bounded on the south by the United States. The northern limit of extensive farming activity is the Peace River Block in Alberta, 500 miles north of the United States boundary. The total land area in the Provinces of Manitoba, Saskatchewan and Alberta is 452,158,720 acres, of which it is estimated nearly 170 million acres can be used for agricultural purposes. The 1936 census showed utilization of land acreage in Western Canada as follows:

No. of occupied farms, 300,523; total occupied acreage, 113,112,500 acres; total improved area, 60,849,957 acres; area in field crops, 40,194,581 acres; area in wheat, 24,837,824 acres.

There are two distinct regions in the west, the short grass prairies of the south regions and the park belt in the central and northern regions. Wheat raising was started in the south but has been gradually spreading northward.

The history of agriculture in Western Canada in the past 60 years falls naturally into three periods. The first of these runs from 1882, when the Canadian Pacific Railway first penetrated the prairies, until 1903. In this period settlement extended westward from the Red River Valley of Manitoba into Saskatchewan, being thickest along the fertile valleys of the Souris, Qu'Appelle and Assiniboine rivers. Most of the settlers came from Great Britain and Eastern Canada.

The second period extends from 1903 to 1918. The early years of the century witnessed a substantial immigration movement. Gradually the southern plains of Manitoba, Saskatchewan and Alberta were taken up by settlers and the movement began to extend northward. The building of transcontinental lines by the Canadian Northern Railway and the Grand Trunk Pacific accelerated settlement and extended wheat growing. The immigration wave was receding when the war broke out in 1914, but the urgent requirements of the allied nations for abundant supplies of food and the favorable prices obtainable for wheat and other farm products resulted in millions of new acres being broken. In 1914, the wheat acreage of the west was 9,335,400. In 1915 it increased to 13,867,715 acres. By 1918, the year the war ended, wheat acreage in the west was 16,125,451.

During this period new agricultural development was evident in the northern sections of the prairie provinces, and particularly in the Peace River district in Alberta.

The third is the post-war period. The years from 1918 to 1921 were ones of low yields but the prices remained high. Wheat acreage in 1921 reached 22,181,329. When wheat prices fell in the early 20's acreage was reduced. When recovery began to make itself felt in 1924 immigration was resumed on a moderate scale and continued until 1929 when the great depression commenced. The growth of population in the west from 1901 to 1936 is given by the federal census as follows.

	1901	1936
Manitoba	255,211	711,216
Saskatchewan	91,279	930,893
Alberta	73,022	1,195,112
		772,782
		2,414,891

Wheat acreage in 1906 was 5,096,053, and in 1939, 25,813,000 acres. The highest acreage in any one year was in 1932 when the figure was 26,395,000 acres.

The greatest volume of wheat production in the west was in 1928, when the total was 544,598,000 bushels, or 23.5 bushels per acre. The greatest yield per acre was in 1915 when the average was 26 bushels.

The Great War of 1914-18 was the principal cause of Canada's rise to a great wheat exporting country. Prior to the war Russia was the main source of Europe's import wheat requirements, but the closing of the Dardanelles by Turkey as an ally of Germany and Austria prevented wheat reaching Britain and France from the Black Sea. Canada expanded her acreage to become the leading wheat exporting nation of the world, which position she still holds.

THE WORLD'S QUALITY WHEAT

High-grade Canadian wheats are recognized all over the world as the strongest wheats in international commerce. The high percentage of their protein content and its excellent quality is accepted abroad as characteristics of "Manitobas", the international name for wheat from the Canadian prairies. The long hours of sunshine, the cool nights, and the low rainfall, all so characteristic of prairie conditions, combine to produce that quality in Canadian spring wheat which makes it desirable in the bread "mixes" of Europe, and particularly of Great Britain.

Flour made from Canadian wheat has a high water-absorbing capacity, turns out a dough of excellent handling qualities, capable of withstanding wide variations in fermentation, and producing a large, well-piled loaf of bread of good texture. While flour made exclusively from Canadian wheat does not seem to be popular in Britain, the qualities which enable it to produce a loaf such as described above, and which can be imparted to weaker flours with which it may be blended, make it desirable in countries which produce and import weaker types of wheat.

In Great Britain wheat from Australia is classified as the best of the "weak wheats," being valued for its high flour-yielding capacity of good color and flavor-imparting qualities. Argentine wheat and United States hard red winter export types are classified as typical "fillers." Domestic and Indian wheat are included to make up the flour mix. The aim of the British is to produce a flour of constant baking properties. Wheats from all over the world come into the British market and the miller there is skilled in the art of blending and is able to produce remarkably uniform flours, adapted to the domestic baking practices, and to producing the type of bread demanded by the consuming public.

The constant aim of Canada should be to do everything possible to maintain the strength and quality of the wheat that must seek a market overseas. Normally 75 per cent of Canada's wheat production is exported. For decades the quality and strength of Canadian wheat has been proverbial in international trade. It is desirable that such characteristics be maintained. The bulk of the wheat entering international trade is of the winter variety. That means it is seeded in the autumn and harvested in the following spring. Such wheat (apart from the red winter wheat of the United States' midwest) is usually soft, white and starchy, as compared with the typical hard, red, vitreous Canadian prairie wheat. Competition is very keen in winter wheat, but there is a special demand for such wheat as the Canadian prairies produce, and it usually commands a price premium as a consequence.

WHEAT HANDLING IN CANADA

Wheat flows to market on the Canadian prairies much in the same manner as rivers flow to the ocean. From thousands of primary delivery points small streamlets are started off, which eventually join the main rivers of grain. The largest of these flows to terminals at the Head of the Lakes, where the twin cities of Fort William and Port Arthur stand. Another stream goes to the Pacific, where terminals are located at Vancouver, New Westminster, Victoria and Prince Rupert. A still smaller stream goes to Churchill on Hudson's Bay, Canada's baby grain port.

Table of distances from Western Canadian central points to the various ports:

From—	To— ✓			
	Vancouver.	Ft. William.	Montreal.	Churchill.
Calgary	642	1,267	2,190	1,190
Edmonton	769	1,253	2,163	1,159
Regina	1,108	783	1,780	825
Saskatoon	1,095	932	1,862	790
Winnipeg	1,405	419	1,423	950

Between 70 and 80 per cent of the wheat harvested in Western Canada is delivered by the time the Great Lakes are frozen, which is usually by the second week in December. In years of average and large crops there is a race to get as much wheat as possible down the lakes before the ice is formed. To accommodate the grain rush, terminal elevators with a capacity of approximately 92 million bushels have been built on the waterfronts at the Head of the Lakes. The Pacific ports are, of course, open the year round. But that route has not been established very long and conditions at times mitigate against a large and constant flow passing through them. In war-time, for instance, the big demand is for wheat on the Atlantic seaboard. Terminal storage on the Pacific totals approximately 20½ million bushels. Churchill is somewhat of an experiment as a grain port. Navigation is restricted to a comparatively short time in the summer. The federal government built a terminal elevator there of 2,500,000 bushels capacity.

The total capacity of the Canadian elevator system, as given by the Board of Grain Commissioners on December 1st, 1938, was 422,824,220 bushels. The total number of country elevators was given at 5,679, with a capacity of 189,707,100 bushels. Most of these country elevators are located in the prairie provinces. Public, semi-public and private terminal elevators, together with mill elevators, make up the balance of the available storage space. Terminals are located at strategic points at Great Lakes ports, at Montreal and Quebec on the St. Lawrence River, and at Halifax and St. John on the Atlantic seaboard. Use is also made of the terminals at Buffalo, and Canadian wheat is frequently diverted down the Erie canal to great ports on the United States Atlantic seaboard.

The western provinces are dotted with country elevators, each one having a storage capacity ranging from 25,000 to 90,000 bushels. The standard average structure is of 35,000 bushels capacity, and is built of wood. Between 16 and 20 bins are provided for the separate grades of grain. A farmer hauls his wheat by wagon or truck into the elevator where it is weighed on platform scales and then dumped into a receiving pit underneath, from whence it is elevated to the peak of the structure and spouted to the desired bin. The wagon or truck is then weighed and this is deducted from the total weight in order to arrive at the volume of wheat delivered. When it comes time to load the wheat into cars for despatch to terminals, the spout from the shipping pit, located beneath the bins in the center of the elevator, is utilized to fill a box car. The handling of the grain is accomplished by mechanical elevation and the force of gravity, guided by spouts for effective distribution.

HOW THE FARMER SELLS

When a farmer delivers wheat to a public country elevator he may dispose of it for cash to the elevator or he may store it to be sold or shipped out at some future date. There are four ways of storing grain in a public country elevator, i.e., graded storage, for which an ordinary elevator receipt is issued; subject to grade storage, for which an interim elevator receipt is issued; special bin storage, for which a special bin elevator receipt is issued; and cleaning storage, for which a special bin elevator receipt marked clearly across the face with the words "To be cleaned before being shipped" is issued.

There are several methods by which a farmer can sell his grain. The method will depend upon the location of the grain and the conditions of the sale. When a farmer has grain for sale it may be in any one of three locations, in the country elevator, in the railway car on track or in transit, or in the terminal elevator. The conditions of sale may be (a) cash in full at time of sale, (b) part cash at time of sale and the balance of the cash when the transaction is completed.

The farmer may sell his grain as he delivers it to the elevator or after he has it in store in the elevator, either direct to the elevator operator or manager, or to a licensed grain dealer. If it is a private or mill elevator the sale will have to be direct to the elevator as delivered. If it is a public elevator it may be either to the elevator or to a grain dealer.

When grain is sold for cash upon delivery at the elevator each wagon or truck-load must be weighed at the time of delivery. The operator and farmer must agree upon the grade and dockage of each load and the operator issue an Ordinary Cash Purchase Ticket for each load and deliver it to the farmer or driver of the wagon or truck.

When grain in store is sold for cash the farmer must surrender his elevator storage receipts and take in lieu thereof an ordinary cash purchase ticket with all lawful elevator charges deducted. The ticket must be dated on the day the receipts were surrendered.

If the grain was stored according to grade, the grade and dockage that was agreed upon on the ordinary elevator receipts must be used on the cash ticket.

If the grain was stored subject to grade and the grade and dockage mutually agreed upon or have been established by the Inspection Branch, this is the grade and dockage that must be used on the cash ticket.

If the grain was special binned and the farmer desired to sell it for cash to the elevator he and the operator would have to agree upon the grade and dockage. If the grain was stored for cleaning and the cleaning had been completed the farmer and the operator would have to agree upon grade, similar to the procedure for Special Binned Grain.

The Board of Grain Commissioners exercises a general supervision over the handling and marketing of grain under ample powers provided by the Canada Grain Act. This Act is considered as a Bill of Rights by the western farmer. From time to time it has been amended to give him additional protection.

GRADING CANADIAN WHEAT

Wheat is purchased in Europe by three methods: on "sample", on the "fair average quality" basis, and on the "government certificate final" basis. The simplest is the "sample" method. A cargo of wheat is assembled, a representative sample sent to the buyer, and the price arrived at on the premise that the entire cargo will be up to the sample.

The "fair average quality" method, or as it is usually termed, "f.a.q.", is the system used in the sale of wheat from Australia, Argentina and India. Samples of the wheat are gathered in the country at harvest time, or immediately prior thereto. Then further samples are taken from shiploads as they move into international trade and the results are forwarded to Europe, where they are carefully examined and set up as a standard for the crop for the year. As the wheat is purchased and cargoes reach their destination, comparison is made with the "f.a.q." samples. If the grain is inferior to the standard the value is arrived at by arbitration. In Great Britain the London Corn Trade Association are the arbitrators. There is a slight difference in the case of Australia in the setting up of standards for the year's crop, but the principle is much the same.

In the countries using the "f.a.q." system of grading the entire wheat crop is more uniform than is the case in Canada, and the system seems to work out fairly satisfactorily.

It has been the practice in India, Australia and Argentine to ship wheat bagged. Elevator storage facilities in these countries are comparatively limited. Of late years there has been a tendency towards increased elevator building and bulk handling of grain.

Canada sells her wheat on the "government certificate final." Under this system the buyer agrees to accept the grain as it is certified by the government grader, and once purchased, there can be no recourse to arbitration. Canada's grain is handled in bulk, is officially graded by federal

government inspectors as it passes through various inspection points on its way to the terminal elevators, and in these elevators each grade is segregated under government supervision. When the grain is loaded on ships for transportation to its final destination, it is again graded by government inspectors to insure that it is up to the quality standard called for in the certificate.

It is an advantage to farmers of Western Canada for wheat to be sold on the "government certificate final" because they can know when they sell their grain exactly what its grade is. If wheat cannot be definitely graded where it is produced the bulk system of handling cannot be safely carried on.

The Canadian prairies are located in the heart of the continent, a long way from tide-water. The bulk of the wheat moves eastward down the Great Lakes, which are frozen in winter-time. There is only a short period between harvest and freeze-up, and a large volume of wheat must flow freely through the bottleneck at the head of the Lakes in order to get to market before freeze-up comes. Bulk handling permits grain to run like a river. Any other system of grading would choke up the movement of Canadian wheat to market, particularly in years when good crops are harvested.

Western Canada's wheat is graded very largely on the appearance of the grain. Carefully trained federal government employees do the grading. These men become extraordinarily adept at their task and it is remarkable how cleverly they can tell the grades of various samples. Nevertheless, the system is dependent upon the human element and certain discrepancies make themselves manifest at times, much to the disgust of the farmers.

The only positive measurements which can be taken are: weight per bushel, percentage of vitreous kernels present, percentage of foreign material present, and the moisture content of the wheat. These factors can be gauged with exactitude, but the balance of the grading must be done with the eyes.

Canada's wheat gains access to overseas markets largely on its strength, which is based on the quality and quantity of its protein content. Such being the case, the most accurate grading system would really be a chemical analysis rather than ocular judgment. The main obstacle in making chemical analyses or protein tests is the length of time required. In Western Canada wheat moves to market with great rapidity and anything that would tend to delay the movement would simply mean wheat would be backed up on the farms in an unsaleable position. In the autumn of 1939 deliveries from farmers were as follows:

September	202,256,632 bushels
October	77,902,121 "
November	31,999,117 "
December	21,266,083 "
Total	336,423,953 "

The monthly average of the above four months is over 84 million bushels. If each car had to be graded on a protein basis, wheat simply couldn't be delivered in such huge volume.

Oddly enough, too, overseas customers do not seem to want Canadian wheat to be graded on a protein basis. This was the discovery of the delegation sent overseas some ten years ago, headed by Dr. Robert Newton, Dean of Agriculture, University of Alberta. Overseas wheat buyers and flour millers claimed that protein grading was unnecessary and the present system satisfactory just as long as Canadian farmers maintained the quality of the product and Canadian wheat graders performed their tasks scrupulously.

The first five grades of Canadian wheat are fixed by federal statute. They are: Manitoba One Hard, Manitoba One Northern, Manitoba Two Northern, Manitoba Three Northern, and Manitoba Four Northern. Number One Hard must have a minimum weight per bushel of 62 pounds, must be free from all forms of damage, containing only the best varieties and the largest percentage of hard, red, vitreous kernels. The only significant difference between One Hard and One Northern is that the latter has a slightly lower weight per bushel and the percentage of hard, red, vitreous kernels may be a trifle less. With each lower grade a little more damaged wheat is permitted.

Statutory grades are the grades defined by Parliament, embodied in the Grain Act, aforementioned, and do not vary with each crop.

Commercial grades are those set by the Committee on Grain Standards, to take care of grain which, because of climatic or other conditions, cannot be included in the statutory grades.

Tough grades include all wheat that contains over 14.5 per cent moisture and up to 17 per cent.

Damp grades include all grain with over 17 per cent moisture and which is unfit for warehousing.

Rejected grades include all grain excluded from above grades on account of damage, foreign odors, excessive mixtures of other grains or other foreign matter.

Smutty grades include all grain which has an unmistakable odor of smut, or which contains smut balls or smut spores.

THE RAILWAYS MOVE THE WHEAT

One of the biggest railway jobs in the world is the movement of wheat from the farms of Western Canada to the terminal elevators at Port William and Port Arthur on Lake Superior, and the Pacific Coast ports. Nowhere else in the world is there a situation quite parallel to the grain movement of Western Canada. Here three-quarters of the grain must go to the export markets. It is a long haul to tide-water, the Great Lakes freeze over early in December, and in years of good crops, like that of 1939, the railways are subjected to heavy pressure.

The two Canadian railways have between them about 80,000 freight cars available for the grain movement. At the peak of the season around 5,000 carloads of grain are delivered daily to the Head of the Lakes. It requires about 1,000 freight engines to handle the grain movement. One engine can haul from 60 to 75 loaded grain cars, and can pull back from 100 to 125 empties.

The year 1939 was an exception due to the plugging of the terminal elevators, but usually a freight car can make, on an average, eight trips with grain during September, October, November and December. The average time taken from shipping points in the heart of the prairies to the Lakehead terminals and return is about 14 days per car. The average capacity of grain cars is around 1,600 bushels. Their life depends upon the care received, but the average box car depreciates in value about 10 per cent each year.

The organizing of the grain movement requires months of preparation. During the growing season the railways keep careful check on conditions in every portion of the prairie provinces. The freight cars are carefully gone over and made "fit to carry grain." As the crop advances and there is more definite information as to where the heavy yields will be, the grain cars are allotted to strategic points. From these points different branch lines can be supplied at short notice. No one branch line can have a surplus of freight cars while other lines require more to meet their needs.

The biggest movement of grain in the history of Western Canada was when the 1928 crop went to market. That year the railways moved over half a billion bushels. Long experience has taught the Canadian railways to be expert in handling the grain movement.

THE GRAIN EXCHANGE

The three principal grain exchanges in the world are located at Liverpool, Chicago and Winnipeg. Due to the extensive wheat production and exportation in North America there is greater activity in the exchanges on this continent than elsewhere. The Chicago exchange is the largest operator in "future" trades, and Winnipeg is the world's largest "cash" market for wheat.

The exchange provides a meeting place for traders whose operations in buying and selling result in the establishment of price levels. Prices vary from minute to minute, from hour to hour, from day to day, and from week to week, indicating the changing opinion of a large number of people who participate in buying and selling. These include dealers, flour millers, exporters, importers and speculators. Numerous factors enter into the formula of price making, the principal ones being supply and demand, weather conditions in the wheat growing areas of the world, the general economic situation, and the intervention of war.

It was in 1887 that the Winnipeg Grain and Produce Exchange came into being. Western Canada was then just commencing the expansion in wheat production which finally made it the largest wheat exporting area in the world. Up until 1903 only a cash business was done on the exchange, but on January 27th of that year a "futures" market was opened and a clearing house established. The present Winnipeg Grain Exchange was the direct successor of the older institution and was formed in 1908. It is a voluntary association with a constitution, by-laws, and regulations of its own. The various grades of wheat and coarse grains are bought and sold by open offer and acceptance in the pits. Contracts are made for "cash" grains in various "positions". Grain may be dealt in "on track", meaning that the grain is in a railway car; "billed and inspected," which means that the grain has passed through the Winnipeg yards, has had official inspection, and is on its way to the Head of the Lakes; or as "spot" grain, which means the grain is in store in terminal elevators at Port Arthur or Fort William.

Probably the most important service rendered by the grain exchange is its provision of facilities for "futures" trading. This permits the making of contracts by members for the purchase and sale of grain for delivery in the future in certain specified months. The Winnipeg exchange has found it convenient to specify delivery in the months of October, November, December, May and July. When the time comes for the delivery of the grain it must be located in a terminal elevator at Port Arthur or Fort William. The contracts call primarily for the delivery of wheat of grade One Northern in units of 1,000 bushels, but it is permissible also to make delivery on the contracts in the grades of Two, Three and Four Northern, Special Four, and One and Two C.W. Garnet, under discounts of fixed amounts per bushel according to the grade delivered. These grades are called "contract grades", and delivery on "futures" contract must be made in one of them.

The above, in brief, constitutes the "futures" market, and it is this "futures" market which enables the operation known as "hedging" to be performed. "Hedging" on the grain exchange is a device by which the holder of wheat seeks to protect himself against the risk of loss through fluctuations in price. The operator of a country elevator, for example, after a purchase of wheat from a farmer, sells on the exchange an equal amount for future delivery and thus protects himself against a loss through a fall in price. Later on the elevator operator can sell for cash the wheat he has purchased and then take back the "futures" he has sold, or he can hold the wheat and deliver it "against the option" when the delivery month comes around.

The same general considerations apply to the "hedging" operations of terminal elevator owners, exporters, foreign importers, and millers. A miller, having sold grain in the form of flour for delivery at a future time, hedges his sale by buying a future contract. If the price of the grain required

to fill his order rises, he will incur a loss. But the price of the "futures" contract has risen also, and the sale of that will compensate him for the loss incurred on his original transaction.

A substantial proportion of the grain handling business is done on credit. Canadian banks may loan as much as \$200 million in the fall to finance the movement of the crop. The banks support the "futures" system, as it insures dealers against loss and makes the bank loan a better risk.

CRITICISM OF GRAIN EXCHANGE SYSTEM

The grain exchange system has been the center of a controversy in Western Canada for many years. A large number of farmers are critical of the system and this feeling has persisted in such farm organizations as the United Farmers of Alberta, Saskatchewan and Manitoba, the Wheat Pools, and the political bodies elected to represent the farmers. It is probably fair to say that the same antipathy to grain exchanges occurs in farmer groups throughout the world. Sir Josiah Stamp, who conducted an investigation into trading in grain "futures" in Canada in 1931, mentions that in 1893 there was universal opposition by farmers in Great Britain to grain exchange methods. In the United States farmer hostility to grain exchanges finally resulted in the establishment of the Grain Futures Administration, created to study and supervise the operations of the grain exchanges.

The principal farmer criticisms of the exchanges are: 1. The dependence of the exchange system on speculation; 2. The seemingly unreasonably frequent changes in prices; 3. While the "futures" market may insure grain dealers, bankers and flour millers against losses, it provides trivial, if any, price insurance for the farmers; 4. The veil of secrecy behind which the exchange operates.

It is generally admitted by supporters of the grain exchange system that a substantial amount of speculative interest is necessary to create an adequate and ready market for "hedged," particularly during the period when "hedging" sales exceed "hedging" purchases. In the various investigations into departments of the grain trade held by Royal Commissions in Canada over the years, witnesses supporting the grain exchange system were unanimously of the opinion that an active, purely speculative market in "futures" is essential to successful "hedging." Furthermore, the evidence showed that the majority of the army of small speculators whose operations give the required buoyancy to the market lose money in their ventures.

Dr. J. W. T. Duvel, Chief of the Grain Futures Administration, Department of Agriculture, Washington, in giving evidence before an investigatory commission, said: "There are two factors involved in the question of marketing grain; that is the cost from the standpoint of the merchandising of grain and the cost to society as a whole. Now we try to stay away from that last part. Nobody knows what the cost to society as a whole is, but we do know that if added to the cost of merchandising the grain, it would come up pretty high. That's an entirely different issue. I say that, because the majority of people who speculate in the grain market lose their money. Were you to add all these losses to the cost of merchandising we might be able to believe that we have intelligence enough in this country to find a better and cheaper way."

The farmers contend that this dependence on a large group of small speculators is a decided weakness of the exchange system. A witness for the Wheat Pools before the Stamp Commission in 1931 said: "We contend that an additional contributory factor to the present ruinous prices is the failure of the institution of speculation to assume anything like the risk carrying function so commonly attributed to it. Following the speculative debacle of 1929-30 which carried prices far too high, the general public has lost enormous sums of money, and confidence as well, and are not at present in the market with sufficient resources to carry the risk of price fluctuation by buying "hedged" and whatever contracts may be

offered by "short" sellers. Consequently, we have had a situation lately where more wheat was offered for sale than there was consumptive or speculative investment demand to absorb, without sharp recessions in price."

From 1930 to 1935 John I. McFarland of Calgary, Alberta, veteran western grain man, was in charge of the wheat price stabilization operations of the federal government. Latterly for a few months he was chairman of the Federal Wheat Board. Subsequent to his resignation, Mr. McFarland made the following statement concerning the grain exchange system: "Any system which will not tolerate a generous world supply and has no facility to hold or remove the excess, except by improvident and ruinously low prices, in order to effect a balanced wheat supply at a later time, is inimical to the welfare of a country such as Canada. It is my conviction that the Dominion cannot afford to depend upon the "futures" system of price-making, especially while governments in competitive, as well as import, countries, continue to maintain their farmers in production by various forms of assistance."

Certainly the presence or absence on a large grain exchange of a large body of small speculators has a decided effect upon the price trend. This makes for seemingly inexplicable ups and downs. The farmers are frequently exasperated by vacillating prices and usually find it a hopeless task to try to guess the trend. Sometimes speculators run away with the market as they did for a time subsequent to the declaration of war in September, 1939, when the Winnipeg exchange authority had to place drastic curbs on speculation. This subdued the gambling spirit and prices dropped substantially.

The grain exchange system provides no insurance against loss for the farmers, even although it may be an effective instrument to prevent losses for elevator organizations, banks and flour mills. The Western Canadian wheat farmer lives in a society where the price of virtually everything he buys is fixed, with a degree of rigidity. The cost of the rail haul to the terminals never varies from year to year, whether wheat is \$2.00 a bushel or 50c. The cost of educational facilities, professional services, and skilled labor is pretty well fixed, the tendency over the years being to increase rather than diminish. Manufacturers arbitrarily fix the price of their products. But the farmer must accept for his wheat the prices which prevail on the grain exchange, which is nothing more or less than a great auction market.

The farmers of Western Canada have never been able to obtain full knowledge of transactions on the Winnipeg Grain Exchange. The exchange is the center of a wide and intricate organization which dovetails together and exercises large control over the grain trade. This control exists from the time grain enters the country elevator until the time it leaves the terminal elevator. Sir Josiah Stamp said that he found the feeling prevalent amongst many farmers that "someone is making money at their expense unfairly by inside knowledge, manipulation, and undesirable practices." He added, "We cannot claim to have been able to satisfy ourselves conclusively as to the impossibility of such practices existing." Sir Josiah suggested that the federal government might well appoint a person of independent judgment and position who would have the right to be behind the scenes at all times and places in the grain exchange.

The United States, as previously mentioned, appointed a commission for the very purposes stated by Sir Josiah Stamp. The experiences of this commission have been made public from time to time, and unquestionably its presence on the United States grain exchanges has had a salutary effect. This commission reported that in 1932, a year when the United States wheat production was 744 million bushels, dealings in wheat "futures" on all United States exchanges totalled 14,735,000,000 bushels.

Mr. Justice Turgeon in his report issued in 1938, after conducting an extensive investigation into the Canadian grain trade, recommended the appointment of a commission to exercise a supervisory authority over the Winnipeg Grain Exchange. The federal government has intimated that such a commission is to be appointed.

PRODUCERS' CO-OPERATION IN WESTERN CANADA

Shortly after the completion of the Canadian Pacific Railway in 1885, which opened up the western plains, the production of wheat increased rapidly. An acute shortage of handling facilities soon developed. The Canadian Pacific Railway offered concessions to companies who would build elevators along its line. The railway company also prohibited the use of flat warehouses for temporary storage and refused farmers the right to load their grain into cars from loading platforms. These severe restrictions virtually placed the private grain companies in a monopoly position, as farmers, having no alternative, were obliged to accept the price, grade and dockage the grain companies offered.

Farmers complained over the unfair treatment they received and finally a Royal Commission was appointed in 1899 to investigate the grain trade. The Commission held that the farmers' stand was justifiable and recommended reforms to remove the cause of the complaints. The suggested changes were incorporated in the Manitoba Grain Act of 1900. The Act provided that the railroads were to permit the building of flat warehouses and were to provide loading platforms at shipping points. The Act also stated that farmers were to be treated justly in the distribution of cars, but the cars were never distributed fairly. The elevator companies got more than their share. Having won the right to load their own grain, farmers could not exercise it as they had not sufficient cars.

The farmers continued to fight for fair treatment. In 1901 they organized the Territorial Grain Growers' Association in what is now Saskatchewan. The new Association strained every effort to improve the system of grain marketing. It took legal action against the Canadian Pacific Railway in 1903 and was successful in getting the car distribution clause of the Manitoba Grain Act recognized. But the farmers' company did not operate elevators at country points.

In 1905 the private line elevator companies had gained almost complete control of the grain trade at country points. From previous experience farmers knew that local country elevators could not compete successfully with the firmly entrenched line companies so in 1906 they organized the Grain Growers' Grain Company. The new company purchased a seat on the Winnipeg Grain Exchange, where it operated a commission business. By means of loading platforms in the country and their own representatives on the Winnipeg Grain Exchange, farmers at last escaped in part from monopoly practices of private companies.

All went well for the new company for a while. Farmers sent it about one hundred cars a week and were well pleased with the service they received. But the private trade would not give in so easily. After six weeks of successful operation the new company was suspended from the Winnipeg Grain Exchange. The farmers' company offered to meet the objections raised by the exchange but its application to be reinstated was refused. The Manitoba government finally lent its support to the farmers' cause and characterized the action of the exchange as "arbitrary and unjustifiable exercise of powers conferred through your charter." Eventually, the farmers' cause won and the company was reinstated as a member of the exchange.

Farmers were not satisfied with the improvements at country points and contended that local elevators were needed to serve the producers. An attempt was made to get the governments of the prairie provinces to acquire and operate a chain of elevators to safeguard the farmers' interests. The Alberta and Saskatchewan governments turned down the proposal. The Manitoba government accepted it and acquired about 170 elevators during the years 1910-12. Due to a variety of reasons the venture proved a failure and after suffering a heavy loss the Manitoba government leased the elevators to the Grain Growers' Grain Company in 1912.

The Saskatchewan government appointed a commission in 1910 to make a study of the grain trade in the province and recommend steps to bring about improvements. The Saskatchewan Co-operative Elevator Company was formed in 1911 as a direct result of the commission's report. The ownership and control of the company was vested in the farmers' hands. The Saskatchewan government lent 85 per cent of the necessary capital to build the elevators, to be paid back on the amortization plan over a period of twenty years, and guaranteed the company's bank accounts.

In 1913-14 the Alberta Farmers' Co-operative Elevator Company was organized. The provincial government provided 85 per cent of the necessary capital for the construction of elevators and guaranteed the company's bonds. The Alberta government, unlike the Saskatchewan government, did not guarantee the company's bank accounts, so it depended on its financial and selling agent, the Grain Growers' Grain Company, for working capital. The ownership and control of the new company was vested in the farmers' hands.

Steps were taken in 1915 to amalgamate the three farmer companies, which finally resulted in the union of the Alberta Farmers' Co-operative Elevator Company and the Grain Growers' Grain Company in 1917 under the name of the United Grain Growers Limited. The Saskatchewan Co-operative Elevator Company continued to operate independently. It was purchased by the Saskatchewan Wheat Pool in 1925.

The record of the two large co-operative companies since 1917 is fairly well known. Both operated country and terminal elevators and export departments. Both had seats on the Winnipeg Grain Exchange and both used the existing market machinery and followed the trade customs. Both attempted, through direct competition, to give the producers a better price than was received from private concerns. Up to 1923 the two companies had acquired about 900 country elevators and operated terminal facilities with a capacity of thirty million bushels. At the time of the Pools' appearance the two companies had a combined membership of 63,000 and handled about 25 per cent of the total amount of grain marketed in Canada. The co-operative companies eliminated many of the abuses prevalent in the grain trade and rendered valuable services to the producers. As a result of the co-operative companies' activities farmers received a much wider knowledge of the grain business than they had hitherto. The undoubted commercial success of the companies proved the ability of the farmers to attend to their own business and indicated the possibilities of co-operation on a larger scale. In a word, they paved the way for the next important step—the Pool—in the evolution of an extensive farmer-owned and controlled marketing system.

THE WAR OF 1914-18 AND POST-WAR PERIOD

A demand for some form of centralized selling grew out of the farmers' experiences with stable prices during, and immediately after the Great War, 1914-18. In Canada, the United States, Australia and other countries, the marketing of wheat crops during the latter years of the war came under government control. On June 11th, 1917, the Canadian government appointed a Board of Grain Supervisors, on which the growers and various grain interests were represented. The functions of the Board were to regulate the price of Canadian grain with a view to preventing any undue inflation or depreciation of value by speculation and to set a price that would insure a reasonable return to the grower. The Board set a price of \$2.40 a bushel which remained in effect until the end of August, 1917, when \$2.21 a bushel for One Northern at Fort William was finally agreed upon. In 1918 the crop was handled on the basis of \$2.24 a bushel. One Northern at Fort William. Faced with many difficulties the Board proved its ability to cope with the problems and rendered an account of its stewardship which met with hearty and widespread approval.

When the war ended there was a strong current of public opinion in favor of the continuance of government control. The governments of European nations had continued to dominate the wheat trade and the United States had fixed a price of \$2.26 a bushel. In July, 1919, the government formed the Canadian Wheat Board which was instructed to sell that year's crop at a price that would bring the greatest possible benefit to the Dominion as a whole. The stated objective for establishing the Board was, by controlling and centralizing sales, to protect Canada's position in the export market. The creation of the Board by the federal government was conceived to be necessary due to controlled and centralized buying on the part of the chief countries of import. The initial advance to the grower set by the Board for One Northern wheat in store at public terminal elevator at Fort William was \$2.15 a bushel. In addition to this, negotiable participation certificates were issued by the Board upon delivery of grain by the grower, which entitled the holder to a pro rata share in the cash balance remaining in the hands of the Board after the crop was marketed. These certificates were eventually redeemed on the basis of 48c a bushel, consisting of a 30c interim payment and an 18c final payment. This brought the total price received for the 1919 crop by the farmers up to \$2.63 a bushel for One Northern wheat at Fort William.

During the Great War, 1914-18, a tremendous demand for food arose and, with the bulk of the European able-bodied men in the ranks of the various armies, overseas countries were the only available sources for the vast supplies required. The allied nations, and principally Great Britain, used every method of persuasion to induce increased production in the great food exporting nations of the world. Canada in particular responded to the call in splendid fashion. The wheat acreage of the west was more than doubled before the war ended, rising from 7,867,423 acres in 1910 to 16,125,451 acres in 1918. By so doing western wheat producers made a real contribution to the success of the allied armies during the war, but they also created an economic problem for themselves and for Canada. The increased acreage was badly wanted in war time, but since then it has gone to increase world wheat surpluses and depress world prices.

In the summer of 1920, the private grain trade sent a delegation to Ottawa, which urged upon the Dominion government the desirability of discontinuing the Wheat Board. The Canadian Council of Agriculture, representing the organized farmer bodies, forwarded a resolution to the government urging that the Board be continued. Their efforts were in vain. The Canadian Wheat Board ceased to accept wheat on August 16th, 1920, and open trading in the Winnipeg Grain Exchange was resumed. But from May, 1917, to August, 1920, the futures market operated for only three days.

START OF WHEAT POOL MOVEMENT

The drastic decline of wheat prices in the fall of 1920 caused widespread dissatisfaction among growers. Efforts were continued to induce the federal government to re-establish the Wheat Board but unavailing. The government, however, did pass a law providing for a national wheat marketing agency which was to go into effect after the provinces enacted legislation to provide the Board with requisite powers to make its operation effective. Enabling legislation was passed by the governments of Alberta and Saskatchewan in 1922. Manitoba's legislature rejected the proposal and the plan fell through.

In the meantime, the crops of 1921 and 1922 had been sold below cost of production and the farmers throughout the west were in a desperate plight. Hope of a government Wheat Board being appointed was definitely abandoned and the farmers undertook to arouse interest in the establishment of wheat pools owned and controlled by producers and operated on a purely co-operative basis. At the psychological moment Aaron

Sapiro, who gained fame as an organizer of co-operative marketing projects in the United States, was brought to Alberta. With vigor and conviction Mr. Sapiro preached the stirring gospel of self-help through co-operation. His message was carried to every corner of the western provinces. Country and city business men, the press, government officials and individual wheat producers as well as the organized farm bodies, got enthusiastically behind the new proposal with the result that broad plans for wheat pool organizations got under way. In Alberta the organization was pushed forward so that the crop of 1923 could be handled by the new co-operative. In Saskatchewan and Manitoba certain difficulties arose which made it impossible for the Wheat Pool to handle the 1923 crop. But the following year the new system of marketing was instituted in both these provinces.

The Alberta Wheat Pool contract was drawn up and canvassing for membership and acreage commenced on August 20th, 1923. On October 19th the trustees issued the following notice: "Notice is hereby given pursuant to Clause 28 of the agreement, between the grower and this association, that Monday, the 29th day of October, A.D. 1923, is the date which has been fixed on which Alberta Co-operative Wheat Producers Limited will commence operations." The report of the trustees to the meeting of delegates held in Calgary on November 11th and 15th showed that the Alberta Pool had a membership of 25,719 and the acreage under contract totalled 2,536,300.

Some delay was experienced in Saskatchewan and Manitoba in getting under way. In the former province by June 29th, 1924, the Pool membership stood at 46,509 and contracts covered 6,330,000 acres. In Manitoba the provincial Pool was launched on July 2nd, 1924, with contracts covering over 700,000 acres.

On July 29th, 1924, the Central Selling Agency of the provincial Wheat Pools, commonly known as the Canadian Wheat Pool, was organized at a meeting in Regina. Representatives of the boards of directors of the Alberta, Saskatchewan and Manitoba Wheat Pools met to consider the important matter of setting up a single agency which would market the entire wheat supply which would flow to the provincial Pools from their contract signers. A Dominion charter was secured incorporating the new agency as a capital stock co-operative company with the stock equally divided among the three provincial Pools. By the end of September, 1924, the Central Selling Agency was completely organized and ready for business at its Winnipeg headquarters.

OBJECTIVES OF WHEAT POOLS

Having examined the earlier historical development of the Wheat Pool movement in Canada, it is now in order to consider its aims and objectives.

One of its avowed purposes was the instituting of the orderly marketing of grain under co-operative control and administration. The orderly marketing policy of the Wheat Pool was simply an attempt, by regulating the flow of wheat to world markets in accordance with the demands of those markets, to bring about a stabilized condition with a reasonable price throughout the year, in place of a fluctuating market with high prices at one time and low prices at another. The Canadian Wheat Pool's operations were never directed towards actually securing control of wheat prices, but the large volume of wheat handled placed it in a position where it did exercise a stabilizing effect upon the market and minimized price fluctuations which otherwise would have been more pronounced.

Economies of large scale operations was another Pool objective. The entire system was operating on a "service at cost" basis. Office setup, country and terminal elevator systems, sales administration, insurance and other agency connections, cargo superintendence and financing were all conducted with the greatest economy and a low bushel cost.

Entrance into the elevator business was undertaken by the Pools for the purpose of providing better and cheaper service to the grain producers and to give an added measure of control over the grain. A reduction in spreads between various grades of grain and between car-lot and wagon-lot deliveries, and the low cost and reduced profits in grain handling and selling today, are evidence of the Pools' success in this respect. At the present time, largely due to the fact that powerful co-operatives dominate the field, the profit margin in handling and selling grain is narrower than ever before in any previous period in the history of elevator operation in Western Canada. In other lines of business where co-operatives are not influential the reverse has been the case.

Reflecting the attitude of many thousands of grain growers in Western Canada the Wheat Pools viewed the enormous amount of speculation involved at certain times in the grain exchange method of marketing as having drawbacks and weaknesses. The Pools considered that by collective action the farmers could carry their own price insurance, benefit if prices rose from the time the grain was delivered at the country point until it entered into consumption and, conversely, bear the loss if prices fell. It was considered that the established grain exchange system enabled and encouraged those with an inclination to gamble to deal in paper wheat and, in conducting this speculation on a huge scale, prices were made to rise to inordinate heights and fall to lower depths because of the activities of the speculators. The Wheat Pools stood for a policy of direct contact between producers and consumers to avoid what is considered by many to be useless, needless, unproductive expense in the huge scale speculation operations.

A further objective of the Wheat Pools was giving to the producer a voice in the marketing of the grain which he raised. This was accomplished by the Pool system of democratic government and control, which insured that the ultimate decision in matters of policy came from the contract signers on the farms of the west.

In order to develop the plan of direct selling to consumers overseas, the idea that had always been in the minds of the originators of the Wheat Pool, agencies were established in Great Britain and in European countries, whose business it was to enlarge the markets for Canadian wheat. The contact these agencies made with many buyers resulted in friendly relations and broadening trade. However, the grain trade (of the United Kingdom in particular) was opposed to this innovation and the plan was discontinued after John L. McFarland was made general manager of the Central Selling Agency in 1930.

Because the Wheat Pools were actively aware of the importance of correct farm practices each one of the provincial organizations persistently directed its attention and resources towards the encouragement of high quality cereal production. This interest of the Pools was manifest in a number of directions, and perhaps their outstanding effort is seen in the work they have done among junior seed growers in the three provinces. This work has been pursued vigorously by the Pools in co-operation with the departments of agriculture and provincial universities. The stated objectives of the junior seed growers are: To improve the quality of crops on members' farms and in their districts, to demonstrate the value of good seed and the value of good tillage practices, to educate junior farmers in the production and sale of improved seed, to bring together for discussion and demonstration those interested in production problems, to foster the co-operative spirit through club organization and to develop leadership in community projects. This project has been strikingly successful in improving the seed wheat of Western Canada.

The Wheat Pool organization has always taken a progressive attitude towards grain research. Close co-operation with the National Research Council at Ottawa resulted in valuable contributions to grain producers in the way of improved methods of drying damp and tough grades of wheat. Also important investigations were conducted into the milling qualities of spring threshed wheat and the effect of frost on the milling and baking qualities of wheat.

WHEAT POOL OPERATIONS—THE 1929 CRISIS

The operation of the Pools from their formation up until the year 1929 was generally successful. Each passing year saw many thousands of new members enlisted in the ranks of these co-operative organizations. Year after year Pool salesmen disposed of enormous quantities of grain to buyers in dozens of countries, and returned to the producers on the prairies satisfactory remuneration for their labor and skill. Over half of the total prairie wheat was under the Pools' control, the handling and sale of which was performed with efficiency and celerity. From 1923-24 to 1929-30 the Pools handled over a billion bushels of grain and distributed net proceeds to Pool members of \$1,299,983,404.98. Besides this huge amount distributed as proceeds of grain sales, over six million dollars was paid out as elevator patronage dividends after allowing for depreciation on elevator properties and proper charges.

The prices paid by the Wheat Pools during the first seven years of operation were as follows, basis One Northern wheat at terminal elevator:

1923-24	\$1.01
1924-25	1.66
1925-26	1.45
1926-27	1.42
1927-28	1.42½
1928-29	1.20⅔
1929-30	.85

The Pools' method of payment provided for the advance to the farmers of a conservative initial sum per bushel at the time the wheat was delivered, with a subsequent interim payment during the crop year as the grain was sold and a final clean-up payment made after the crop year closed and the season's operations were completed. The method of payment spread the farmer's income over the year and proved satisfactory to the majority of the Pool members.

With the season of 1928-29, the fifth year of combined operation, the three western Pool organizations had 140,779 Wheat Pool members and 67,532 Coarse Grain Pool members. Of the record prairie wheat crop of 1928 of 545 million bushels of wheat, the Canadian Pool handled approximately one-quarter of a billion bushels. As Canada contributed in this peak year 42 per cent of the total international shipments of wheat and flour, the Pool was thus responsible for fully one-fifth of the greatest amount of wheat that had ever moved into international trade in a single year.

The crop of 1929 was devastated by drouth throughout the whole of Western Canada. This aroused speculative fever which shot grain prices to a high level and prospects indicated a strong price situation throughout the market year. The crop year of 1928-29 had seen international wheat shipments reach a total of more than 943 million bushels of which North America had furnished 560 million and Canada the unprecedented total of 406 million. Then came the major break in prices of stocks on Wall Street, New York, in October, 1929, heralding the great depression which caused a drastic decline in the price of commodities, stocks, bonds and values of all kinds, and a terrific disruption in the economic life of the entire world. Although little dreamed of then, wheat was to reach its lowest price in 400 years during the course of the depression.

As has been previously explained, the Wheat Pools' operations provided for an initial payment fixed at a conservative amount and issued upon delivery of the grain to country elevators, this to be followed by subsequent payments as the wheat was disposed of. In the summer of 1929 the initial payment for the crop then on the threshold of harvest was fixed at \$1.00 a bushel, considered at that time reasonably safe. No apprehension was felt

until New York experienced the first sharp reaction on that historic day, October 25th, 1929, when wheat values were shaken throughout the world. A steady but persistent decline then commenced and the Pool was faced with the dilemma of having accepted millions of bushels of wheat from members on the basis of \$1.00 a bushel initial payment and the downward price trend rapidly approaching that figure. The money for the initial payment had been borrowed from the bank on a 15 per cent margin, and those institutions became much concerned as wheat values encroached on the margin of safety.

The crisis came in January, 1930. The banks threatened to close out the Pools, and an appeal was made to the provincial governments of Manitoba, Saskatchewan and Alberta for assistance. The Premiers of these provinces carefully canvassed the situation and decided to support the Pools with the financial backing of their provinces. Then followed several months of heart-breaking suspense, at the conclusion of which it was found sales of wheat during the season had netted an average of 85c a bushel, basis One Northern, while the initial payment had been \$1.00 on the same basis. The Pool found itself short some \$22,217,000. The provincial governments guaranteed this amount to the banks, the proportion among the provinces being approximately: Alberta, \$5,500,000; Saskatchewan, \$13,300,000, and Manitoba, \$3,375,000. At subsequent sessions of their legislatures the three governments passed the necessary legislation validating the action taken and also the terms governing the repayment by the provincial Pools. Each government issued bonds to the banks covering the deficiency of its own provincial Pool, and in return took bonds from the Pool in its province. The provincial bonds were repayable in twenty years and carried interest at $4\frac{1}{2}$ per cent. The price to the banks agreed upon was \$98 for each \$100 bond.

In assuming the responsibility of endeavoring to prevent wheat prices going to very low levels the Wheat Pools undertook a task which, in other nations, was assumed by governments. For a period the Canadian government was thus relieved to a considerable extent of the financial loss and trouble involved in such an undertaking. Subsequently, it came to be accepted as a governmental responsibility that a minimum price should be set for wheat.

WHEAT POOLS ON TROUBLED SEAS

The Wheat-Pool movement experienced a nation-wide storm of criticism following the experience of the 1929-30 crop year. The selling agency was accused of trying to obtain unduly high prices from wheat importing countries; refusing to sell to Great Britain when an alleged offer was made by Hon. J. H. Thomas, member of the British cabinet, for a large volume of wheat; antagonizing European nations so that they, in self-defense, increased their wheat acreages; antagonizing the grain trade of the world so that wheat prices were beaten down in retaliation; holding too large a percentage of the Canadian carryover; and so on.

The Wheat Pools endeavored to reply to criticisms, but their financial losses and the continuation of the depression placed them in a disadvantageous position. About the most difficult thing to controvert was the allegation that Europe was antagonized by the actions of the Canadian Wheat Pools and that the nations there increased their wheat acreages in retaliation. Actually what happened was that European wheat acreage was returning to normal

after the dislocation of the 1914-18 war. The wheat acreage in France never did regain the figures of the years prior to 1914; Germany switched some acreage from rye to wheat; a nominal increase was made in Italy; while the acreage in Britain was less in 1929 than it was before the war. It is true that these countries undertook price protection measures to prevent the farmers going bankrupt, but that move was made subsequent to 1930, when the world level of wheat prices dropped to an abnormally low figure.

The statement that Hon. J. H. Thomas made an offer for a considerable bushelage of Canadian wheat in the fall of 1929 was an untruth, but it was sedulously circulated in Canada and is still believed by many. Hon. Mr. Thomas never did make such an offer. He did suggest, however, that Canadian wheat might be exchanged for British coal but opposition on the part of coal interests in Eastern Canada prevented any progress being made in the proposed plan.

The enmity of the world grain trade to the Canadian Wheat Pools may have had some slight effect, but actually the majority of the grain traders then were optimistic regarding the trend of wheat prices, and suffered financial losses as serious proportionately as did the Wheat Pools. The subsequent elimination of Pool agencies in Europe failed to have the slightest beneficial effect in reviving trade.

In 1930-31 the Wheat Pools continued operation on the usual pooling basis, and a temporary initial price of 70c a bushel, basis One Northern at the terminal, was decided on in the summer of 1930. Later this was dropped to 60c, then to 55c, and finally to 50c. Further declines in the market price of wheat threatened another reduction, but the federal government intervened, Hon. R. B. Bennett then being prime minister. An arrangement was made between the Pools and the banks along with the provincial governments to place the 1930 pooled wheat, together with the carryover from 1929, in the hands of a re-organized Central Selling Agency, under the managership of John I. McFarland, of Calgary, a grain man of recognized ability. Early in January, 1931, the Prime Minister of Canada announced that the government would take certain price protective action and that Mr. McFarland had been given instructions accordingly. Thus, the 1930 pooled wheat and the carryover from the 1929 Pool became involved in the federal government price stabilization operation. When the grain was eventually sold the sum of \$9,628,881.31 was realized above all costs. The sum of \$6,445,576.02 was handed over to the Pools by the government to equalize the 1930 wheat payments. This money was distributed to Pool members in the prairie provinces as follows: wheat payment: Manitoba, \$630,293.28; Saskatchewan, \$3,082,945.97; Alberta, \$2,732,336.77.

In June of 1931, the three provincial Pools divided into separate units in so far as future grain handling was concerned. A new policy of operation was inaugurated. The members were released from their contracts, which had compelled them to deliver all their grain to be marketed on a pooling basis, and each grower was given the right to sell on the open market at any time or to pool his grain if he so desired. The elevator systems built up by the provincial Pools placed each one in a position where it could carry on under the new method of operations. Each Pool organization fully and frankly informed its members as to its position. No effort was made at concealment, the whole story of what had occurred being told, and the exact financial position being presented. Appeals were made for the continuance of support of the Pool elevator systems in order to clear off the indebtedness incurred by the over-payment and to re-establish the organizations on a sound basis. The response of grain farmers of the prairies the first year the Pools operated on the open market system was remarkable. Those who thought the farmers would turn away from their Pool organizations with a sense of rankling injustice and disappointment found themselves mistaken. In every province Pool elevators were given generous support. The loyalty shown was attributed by Pool leaders to the results of long years of co-operative education among the prairie farm population.

FEDERAL GOVERNMENT STABILIZATION

John I. McFarland assumed the managership of the Central Selling Agency (Canadian Wheat Pool) in November, 1930, with the definite understanding that he was to have a free hand in managing the organization. As each provincial Pool organization had set up a sales department of its own, the main responsibility of the Central Selling Agency was the disposition of the Pool carryover from the 1929 crop year and the wheat that had been placed in the 1930 Pool. The wheat on hand at the close of the 1930-31 crop year totalled 76,700,000 bushels.

One of Mr. McFarland's first actions was to close the sales offices established by the Pool in the United Kingdom and continental Europe. He then made vigorous efforts to dispose of the wheat entrusted to his charge. His experiences proved that the marketing problem was one of extraordinary magnitude and finally in June, 1931, Mr. McFarland recommended to the federal government that a policy of taking "hedgies" in the open market in order to stabilize prices should be adopted. The federal government consented, and price stabilization operations started under the direct guarantee of the Dominion of Canada.

Mr. McFarland's term of office ended in November, 1935, and its record is told in the pamphlet, "The Story of Stabilization," written by him at the end of his term. Summed up, his conclusion was that the open market system had collapsed and, in order to permit the grain exchange to function and the farmers to sell their wheat, the Canadian Wheat Pool, acting for the government, was forced to take the "hedgies." World wheat trade was disorganized by governmental action in all important wheat exporting and importing countries in an effort to save domestic producers from the effects of disastrously low prices, resulting in the piling up of enormous carryovers. Mr. McFarland's operations resulted in much higher prices for Canadian wheat than those obtained by growers in Argentina and Australia.

A great deal of apprehension was felt in certain parts of Canada over the possibility of heavy financial loss to the federal treasury from Mr. McFarland's price stabilization operations. In the end the whole undertaking showed a profit of \$9,628,881.31. In fairness to Mr. McFarland, it might be mentioned that he gave his services to the Canadian nation gratuitously. For five years he carried a tremendous responsibility, as a result of which he suffered a health breakdown.

The Wheat Pools, while giving Mr. McFarland the friendliest co-operation in his stabilization efforts, contended that a national Wheat Board was the proper solution for the problem in so far as Canada was concerned. Such an institution, it was maintained, would function more efficiently and with less danger of monetary loss than any effort at keeping alive the open market speculative system. Arguments to this effect were presented to the government from time to time; and finally in July, 1935, the federal Grain Board was formed.

THE CANADIAN WHEAT BOARD OF 1935

A large section of the agrarian population of Western Canada had long been impressed with the desirability of a Federal Wheat Board, and kept up a continual agitation calculated to persuade the government to take the necessary steps towards its organization. During the depression years when the price stabilization operation was struggling against falling wheat values, the Wheat Pools and the organized farmers continually brought representation to bear on the Dominion cabinet in favor of a Wheat Board. These efforts were opposed by the grain trade, who insisted that the open market system was the only sound way to market Canada's wheat. Their answer to statements that the exchange method of marketing had broken

down was that abnormal conditions existed which would disappear in time, and the preservation of a great open market such as the Winnipeg Grain Exchange was a matter of importance in years to come, not only to the wheat growers, but to all of Canada. They suggested that the government put a "crutch" under the market and permit it to operate without other interference. The government followed this advice, in some respects at least, but the general disorganization of the international grain business made it a hopeless task. In 1935 Prime Minister Bennett's government finally decided to form a Wheat Board.

The first draft of the Wheat Board Act provided for a national organization to handle all the grain marketed in Western Canada. The grain trade opposed this on the ground that it was a "compulsory pool," and the measure finally passed made it optional whether a grain producer should deliver his wheat to the Board or sell on the open market. However, clauses were inserted in the Act which provided the Board with power to handle all grain delivered upon proclamation of the Governor-in-Council. These powers have never been put into effect.

The Wheat Board was empowered to pay to producers delivering wheat at the time of delivery a fixed price per bushel to be determined by the Board with the approval of the Governor-in-Council. This meant the fixing of a minimum price. At the time the 1935 minimum price was fixed the Wheat Pool, through their representatives on the Advisory Board, which was a committee of seven members, four representing wheat producers, advocated a minimum price of 95¢ a bushel. Representatives of the trade suggested it would be better to fix a price in the low 70's. The federal cabinet decided on 87½¢ as a minimum price on September 7th, 1935. The previous day the price of One Northern wheat was 85¼¢ a bushel. When the minimum price was announced the market rose to 88½¢ a bushel.

John I. McFarland was appointed chairman of the new Wheat Board, the other two members being D. L. Smith, former manager of the Canadian Wheat Pool, and Professor H. C. Grant of the University of Manitoba. With the defeat of the Bennett government in the October elections of 1935 this Board was discharged, and on December 4th a new Board was appointed by the new Liberal government, with James Murray as chairman and George H. McIvor, former general manager of the Canadian Wheat Pool, and Dean A. M. Shaw, of the University of Saskatchewan, as Board members. The Advisory Committee was dispensed with. This new Board took over 298,355,000 bushels of wheat from the stabilization operations, as follows:

Cash Wheat	122,863,000 bushels
Wheat Contracts	175,492,000 "

An additional 42,000,000 Bushels were delivered to the Board from the 1935 crop after December 4th, 1935, which gave a total of 340,355,000 bushels.

The policy of the new Board was announced as one of free selling without price demoralization. Emissaries were sent to Great Britain and Europe in an endeavor to further the sales of Canadian wheat. Every effort was made to dispose of the Canadian surplus. Argentina had suffered a disastrous crop failure in 1935, as also did the United States, the latter country becoming a net importer of wheat for the first time in one hundred years, taking in all during the crop year some 50 million bushels of Canadian supplies. Europe's crop was lower than the previous year and Russia was only a small exporter. The Canadian crop was also small, the prairie provinces having produced only about 260 million bushels of wheat in 1935 as compared with the long term average production of around 400 million bushels. On Friday, December 13th, 1935, Argentina fixed a minimum price of 90¢ a bushel (Canadian funds) for her domestic wheat, and prices on the Buenos Aires Exchange jumped 20¢. Canadian wheat prices were kept at parity with or below those of other exporting nations during most of the 1935-36 marketing season. In the face of Canada's aggressive selling policy and the absence of competition from Argentina, whose exports

dropped 100 million bushels from the previous year, and also with the assistance of substantial imports by the United States, Canada exported 254 million bushels in 1935-36. Net exports of wheat in the world in that year totalled 526 million, the lowest in recent history.

When the Board finally disposed of its wheat holdings the financial result was as follows:

Loss on 1935 Wheat Board operations	\$11,907,679.06
Profit on Pool carryover and McFarland stabilization wheat	9,628,881.31
Net loss, July 31, 1937	\$ 2,278,797.75

ROYAL GRAIN INQUIRY COMMISSION, 1936-37

In the spring of 1936 the Agricultural Committee of the House of Commons undertook an inquiry into wheat marketing. James R. Murray, chairman of the Wheat Board, in presenting a recommendation for a thorough inquiry into all phases of the Canadian wheat industry, made the following statement to the committee:

"Until recent years our surplus wheat was absorbed into world trade and no one knew, except in the most general way, just how or where it went. The little consideration we gave to this question ten years ago is not sufficient now.

"World trade which averaged 721,309,000 bushels for the ten years 1920 to 1929 was large enough to absorb the surplus from average crops in exporting countries. This situation no longer exists.

"Our problem for the future then is, briefly: Normal crops on present acreage in exporting countries will give from 640 to 740 million bushels exportable surplus. The available market may be only 500 to 550 million bushels.

"How can Canada continue to grow crops of 375 to 425 million bushels and fit into this picture without again piling up unwieldy and burdensome surpluses?"

The federal government decided to accept Mr. Murray's suggestion, and Prime Minister W. L. Mackenzie King announced that a royal commission would be appointed "to inquire into and report upon the subject of the production, buying, selling, holding, storing, transportation and exporting of Canadian grains and grain products, and other questions incident to such matters." It was particularly specified that a study should be made of the causes of the decrease in Canadian grain exports in recent years and the measures which should be taken to retain and extend the marketing throughout the world of Canadian wheat and other grains and their products. Mr. Justice W. F. A. Turgeon, a Judge of the Court of Appeal of Saskatchewan, was appointed commissioner to make the inquiry.

The 1936 growing season witnessed another disastrous drouth in important North American wheat growing regions. Due to lessened production elsewhere in the world, the world carryover was substantially reduced and wheat prices rose. The federal government announced on August 28th that the minimum Wheat Board price would be 87½¢ a bushel for One Northern at the terminal, the same as the previous year, but the farmers could not deliver their wheat to the Board until the price level dropped below 90¢ a bushel on the Winnipeg exchange.

The Turgeon Commission got under way in December, 1936. Sitings were held in Western Canada during the fall and winter, in Eastern Canada and in Europe. The inquiry was concluded in November, 1937. This was the most intensive inquiry ever conducted into the grain business in Canada.

The conclusion reached by Mr. Justice Turgeon was that under normal conditions with open markets in the United Kingdom, a fair relationship between world supply and import demand, and no danger clouds on the immediate horizon, the government should remain out of the grain trade and Canadian wheat should be marketed by means of the futures market system under proper supervision, and encouragement given to the creation of co-operative marketing associations or pools. The government's activities should be confined under these conditions, the Commissioner suggested, to helpful action in regard to trade agreements, assistance to commercial and economic research, to the gathering of information, to promotional services, etc.

It was suggested by the Commissioner that the government should arrange for the supervision of futures trading on the Winnipeg Grain Exchange.

The recommendations offered were for a long-time policy that should be pursued under normal conditions, but Mr. Justice Turgeon stated that upon the facts before him a return to normal conditions was not immediately in sight. Consequently, he did not suggest the immediate dissolution of the Canadian Wheat Board, but rather that it be maintained to meet any situation which might arise.

The Wheat Pools did not agree with the conclusions reached by Mr. Justice Turgeon in his report. They held that the increased productivity of agriculture, the tendency toward nationalistic and self-sufficiency policies on the part of many nations, and the obvious breakdown of the grain exchange system of selling grain, created a condition wherein it was necessary for the Canadian government to maintain an active and constantly operating Wheat Board. Pool witnesses expressed the opinion that small co-operative pools, such as recommended by Justice Turgeon, could at best accomplish only minor objectives.

The Wheat Pool opinion is that individualism and laissez faire, characteristic of world business affairs in the nineteenth century, have gone, probably forever. It is on the theory of laissez faire that such institutions as the grain exchanges operate. Planned organizing and collective action both in government and business are supplanting the older ideas. Canada cannot afford to cling to ancient usages and customs when the world is departing therefrom.

When wheat prices go down to around 50c to 60c a bushel net to the producer, he is making no profit. He is giving away a portion of the labor of his family and himself, the fertility of his farm, and his capital. Such a condition is ruinous to agriculture and certainly not profitable to the nation. Frequent recurrence of such low prices must in the end spell general ruin.

INTERNATIONAL WHEAT AGREEMENT

The idea of an International Wheat Agreement developed out of the World Economic Conference held in London, England, in the spring of 1933. In that year the depression was at about its lowest level and representatives of many nations gathered in the British capital to discuss plans calculated to aid recovery. Little was done by the main conference, but one accomplishment was the calling of a further conference in August of the same year to consider the problem of surplus wheat. Twenty-two countries were represented and a wheat agreement was drawn up, which, while it proved abortive, showed the way to a better international understanding regarding a common world problem.

The situation with regard to wheat as it existed in 1933 threatened disaster to world agriculture and an abnormal world surplus had beaten down the international price level of wheat until it touched the lowest mark

in 400 years. In Canada wheat went as low as 38½¢ a bushel for One Northern at Fort William. That meant the price to the farmer was around 20¢ a bushel at an Alberta shipping point for One Northern wheat. Other exporting countries were faced with similarly disastrously low price levels, and importing countries were feverishly working to protect their wheat producers.

The conference in the summer of 1933 concluded that there did exist a positive over-production of wheat in the world and the best policy to follow was to attempt to adjust the supply of wheat to the effective demand. To accomplish this it was decided that exporting nations be given quotas on the available market, the export allotment for the crop year 1933-34 being as follows:

Canada	200,000,000 bushels
Argentina	110,000,000 "
Australia	105,000,000 "
United States	17,000,000 "
Danube Basin	50,000,000 "

Soviet Russia agreed to limit its crop exports to a figure which would be arrived at through subsequent negotiations.

Included in the twenty-two nations participating in the conference were the main wheat importing nations. On their part they agreed not to encourage any extension of their domestic wheat acreage; to adopt every possible means to increase wheat consumption within their borders; to lower tariffs against imported wheat as soon as prices rose to a certain arbitrary figure (62 gold cents a bushel for British parcels).

The agreement appeared to be a forward step in international relations and a sensible method of dealing with a difficult and dangerous problem. It so happened, however, that Argentina harvested a substantial crop in 1933. Claiming that her elevator facilities were unable to store the surplus after her quota of 110 million bushels had been filled, that nation continued to export without regard to the limitation she had agreed to. Before the crop year was over her total exports had passed 140 million bushels.

Argentina further contended that the meaning of the agreement provided for each country to regulate its internal wheat acreage so that large surpluses would not persist, and that Canada and the United States, who were most responsible for the great increase in wheat acreage which took place from 1914 to 1932, were taking no steps to meet their internal problem. The Argentina action vitiated the agreement.

A series of drouth years in the United States and Western Canada resulted in very small crops being harvested. Argentina experienced a severe drouth in 1935 and her 1937 wheat crop was badly damaged by frost. As a result of these exceptionally bad seasons the world carryover was brought down to 587 million bushels on August 1st, 1938. That was about a normal carryover.

The highest wheat carryover in history was on August 1st, 1934, the figure being 1,188 million bushels. It had been contended that once the excess carryover disappeared and a better balance was restored between supply and demand, low wheat prices would disappear and the farming industry would be re-established, possibly for a generation.

Andrew Cairns, secretary of the Wheat Advisory Committee, kept pointing out that exceptionally bad weather conditions had solved the situation but temporarily, and that world wheat acreage was so large that average crops would be certain to bring about a recurrence of excessive surpluses.

The acreage seeded to wheat throughout the world in 1938, excluding Russia and China, totalled 288,600,000. Average weather was experienced, and the result was a crop of 4,605 million bushels, the largest in history. This crop was 568 million bushels larger than the previous record crop, which occurred in 1928, the surplus from which had caused so much trouble.

The 1938-39 crop year started out on August 1st with a world carry-over of 587 million bushels. World trade in wheat totalled 650 million, not nearly sufficient to absorb the surplus supplies, and the carryover on August 1st, 1939, reached the figure of 1,101 million bushels. The surplus problem was right back on the world's doorstep.

~~The serious situation resulted in the revival of interest in an international wheat agreement, and the Wheat Advisory Committee held conferences during the early part of 1939. Considerable progress was made towards the formation of a new wheat agreement, one of the provisions of which was a minimum world price for wheat. However, the international situation in Europe was rapidly approaching a crisis and war intervened before the Wheat Advisory Committee's plans could be developed to fulfillment.~~

The Canadian Wheat Pools supported the idea of an international wheat agreement. They approved of the proposed quota system whereby each exporting country would be allotted a fair proportion of the available market. The Pools did not favor wheat acreage reduction in Canada, largely because of the difficulty of organizing such a scheme, and the characteristic extreme variation in a spring wheat area such as is Western Canada, a region of uncertain rainfall. The Pools suggested that the quota idea be carried back to the farm; that is to say that each farm be given a quota which represented a share in the available market. It was proposed that the surplus in excess of the quota be retained on the farm as a reserve against bad crop years. In that way the farmer would get a better price than if all the surplus was forced on an over-crowded market, he would have a reserve of grain when a bad year came along, and the world would have a reserve supply in years when a series of crop disasters occurred.

THE BRACKEN CONFERENCE

The year 1937 was notable for the poor wheat crop harvested in Western Canada due to widespread drouth. From an acreage of 24,599,000 a wheat crop of only 156,800,000 bushels was harvested. This was the lowest production on an acreage basis ever experienced in the west. The Province of Saskatchewan seeded 13,893,000 acres to wheat and harvested only 35 million bushels. This record of failure over such a large acreage is probably unparalleled in the history of the world.

While Western Canada's wheat production was low in 1937 that of the world was about 270 million bushels larger than the 1936 production. World trade was at a low ebb, the total volume being only 512 million bushels, of which Canada supplied only 86¾ million. The world carryover on July 31st, 1937, was down to 518 million bushels. The heavy surpluses of previous years had disappeared and the supply and demand situation was in much better balance. The small Canadian crop brought about a substantial price increase, and in January, 1938, the president of the Winnipeg Grain Exchange stated: "Production has been dropping for the past few years and in the future in some countries they may find it difficult to meet consumption demands."

The Turgeon grain inquiry made its report in the spring of 1938, and the Canadian government made preliminary moves to implement the recommendations. But by early summer it became apparent that a huge wheat crop was in prospect throughout the world and prices commenced a steady decline. The final figure of world production was 4,605 million bushels, creating a new record.

The Canadian crop in 1938 was 360 million bushels, the first sizeable production since 1932. Consternation was felt in the west over the poor price prospect and pressure was brought to bear on the federal government to have the Wheat Board placed in operation. The government consented,

and a minimum price of 80c a bushel, basis No. One at the terminal, was fixed. As the open market price ranged substantially below that figure, the Wheat Board got all the wheat, and Eastern Canada became alarmed at the prospect of a heavy loss to the federal treasury, and pressure from that source was brought to bear to force the government to end the operations of the Wheat Board after the 1938 crop was marketed. In January, 1939, Hon. J. G. Gardiner, minister of agriculture, intimated that the prospective loss at that time would cost the government around \$18 million.

Alarmed by the trend of events, Hon. John Bracken, Premier of Manitoba, called a general conference in Winnipeg on December 12th, 1938. Premier Bracken stated in issuing the call for the conference that failure to secure and maintain adequate markets for the surplus products of western agriculture had created one of the most serious economic situations which had ever faced the citizens of Western Canada.

In his opening address to the Conference Premier Bracken said that from 1922 to 1930 world demand for wheat (largely an European demand) averaged 763 million bushels annually, while from 1930 to 1938 the average figure was 582 million bushels. During the five years prior to the Conference demand had averaged only 532 million bushels annually. The reduction was thus around 230 million bushels a year.

Some of the questions that Hon. Mr. Bracken put to the Conference were: How is Western Canada to meet the problem which confronts it and continue an export economy in the face of existing conditions? How is Western Canada to compete in available markets with production costs maintained at a high level through the instrument of the Canadian tariff?

The Bracken Conference lasted four days, and a wealth of information was provided by authorities in various fields of agriculture. The addresses were subsequently published in pamphlet form.

No recommendations or resolutions were passed by the Conference, but subsequently a representative committee was set up and meetings were held in various cities in Western Canada. This committee's greatest accomplishment was the presentation to the federal government of a well documented appeal to continue the Wheat Board as an active organization in 1939. The government consented to this appeal, and proposed a minimum price of 60c a bushel, basis One Northern at the terminal. The committee urged that this price be raised to 80c, and finally the government compromised on a 70c figure and limited the volume of deliveries by each individual farmer to 5,000 bushels.

The government also put into operation the Wheat Co-operative Marketing Act, which provided any group of producers or elevator operators could set up a central selling agency to handle wheat on a co-operative basis with a guarantee advanced by the government of 60c a bushel to the co-operative, out of which administrative and carrying costs would have to be met.

The government also passed the Prairie Farm Assistance Act, intended to aid farmers in years of distress and crop failure by graduated payments on an acreage basis.

THE WAR YEAR 1939

On Sunday, September 3rd, Great Britain and France declared war on Germany. This momentous event changed the whole outlook in the world wheat situation. The usual trend of wheat prices in war time is upward, and the large grain exchanges throughout the world were soon the centers of speculative activity in wheat. On the Winnipeg Exchange a regulation was in effect restricting daily speculative movements to 5c a bushel upwards, and 5c downward. For several days after the declaration of war the price

rose to the daily limit, until on September 7th, it reached the high point of 81½¢ for cash wheat. An irregular decline then commenced, lasting for about two months.

In Great Britain the government, immediately war was declared, nationalized the grain trade and the flour milling industry. In the 1914-18 war this step was not taken until over two years had elapsed. In Australia a similar step was taken with regard to wheat. The Canadian government refused to follow the example and permitted the grain exchange to remain open.

The world wheat crop of 1939, while considerably smaller than the 1938 crop, was of substantial proportions, being around 4,267 million bushels. At the beginning of the autumn it was thought that the crop would be very close in total yield to the 1938 figure, but substantial damage to the Argentine crop in October and November cut at least 338 million bushels off the world wheat production.

Canada's 1939 crop, now estimated at 489 million bushels, was the second largest in the country's history. Before the war broke out in Europe, the prospect of Canada being able to sell a substantial proportion of her huge wheat surplus at a reasonable price looked unpromising. The world carryover from the previous crop year, 1938-39, was 1,100 million bushels, and the prospects, indicated a record-breaking carryover at the end of the 1939-40 crop year.

The huge 1939 Canadian crop was harvested under favorable conditions and marketed at an exceptionally rapid pace. Primary deliveries in the three fall months were as follows:

September	202,256,632 bushels
October	77,902,121 "
November	34,999,117 "
Total	315,157,870 "

During the period of heavy primary deliveries exports were at a comparatively low rate. The British Cereal Import Commission, whose chairman is James Rank, the leading British flour miller, evidently thought Canadian wheat prices were being held too high and made extensive purchases in Argentina, Uruguay, Australia and Roumania.

The farmers of Western Canada delivered the bulk of their wheat to the Canadian Wheat Board. This fact possibly saved the market from complete collapse, because the hedging of 300 million bushels of wheat would have required extensive purchasing by speculators and the speculative fever had not proven to be very strong. The Wheat Board was thus able to hold the market in the face of extraordinarily heavy deliveries and comparatively small export sales. The visible supply on occasions topped the 350 million bushel mark, breaking all previous records in that respect.

Some people expected wheat to soar in price simply because a war was in progress. They overlooked the fact that Europe had been preparing for war for several years and substantial reserves had been stored up in that continent. Germany, for instance, is believed to have a reserve of from 200 million to 250 million bushels of wheat. World wheat supplies (current crop and carryover) are estimated at 5,368 million bushels for the 1939-40 crop year, which is over 53 per cent larger than in 1914. World wheat disappearance is only 30 per cent larger than in 1914. Never before had a major war started with such an abundant supply of food in the world.

Canada's position was improved by her proximity to Great Britain in comparison with Argentina and Australia. In modern naval warfare submarines and mines take a heavy toll of shipping, and the slow and expensive convoy system has to be used for protection. Ocean freights rise, and the shortest water haul is the one most desired. Canada's available wheat surplus of over 400 million bushels offers a satisfying degree of security to Great Britain and France. Great Britain is particularly vulnerable from

a food supply standpoint. She has 46½ million people concentrated on a little island, 660 to the square mile, and even the most strenuous efforts at food production can produce less than one-half of the food requirements of the people.

The Wheat Pools of Western Canada and the farm organizations asked the government to close the grain exchange and fix a price for wheat more in keeping with the prices of other goods and services which farmers have to buy. The prairie farmers realize that they are likely to be called upon to guarantee ample supplies of food for the allies during the war. They have not asked for an exorbitant price for their products, but feel that a reasonable parity should be maintained between the prices of farm products and the prices of the things they have to buy. The Wheat Board minimum price of 70c a bushel for One Northern at the terminal means an average net price to the producer of 50c a bushel.

Two events occurred in the autumn of 1939 which altered the wheat picture materially. Argentina's wheat crop was ruined by a surplus of wet weather in October and severe frosts in November and early December. The main winter wheat producing region of the United States experienced the driest autumn in its history and went into the winter with a condition number of 55, the lowest on record. That indicated a crop of less than 400 million bushels.

The opinion of agricultural authorities in Canada is that the western farmer should not increase his wheat acreage for 1940, at least. Farmers are of the opinion that the government should assume a responsibility in advising what farm products the allied nations need the most in order that a planned effort may be undertaken to meet the deficiencies, so that indiscriminate increases in production may be avoided.

PRODUCTIVE WESTERN CANADA

Grain production is the industry upon which Western Canada depends. The growing of wheat is outstandingly the most important phase of grain production. In the fortunes of the grain producers are involved the fortunes of those who seek a market in the provinces of Manitoba, Saskatchewan and Alberta. The value of the western wheat crop is an accurate index of the purchasing power of the western market.

Wheat is of vital importance in Canada's national economy. When Prime Minister of Canada, Hon. R. B. Bennett made a speech in the House of Commons in the course of which he said:

"For over a quarter of a century the area between the Great Lakes and the Rocky Mountains in Western Canada was producing millions of dollars of new wealth year after year in the very year in which the effort was made. That has had the most significant influence upon our economic life of any single factor in our development, because never have so few people, as far as the ordinary history of the world is concerned, produced so much new wealth in a given time as has been produced in the last thirty years between the Great Lakes and the mountains in this Dominion."

The record of production of Western Canada, as compiled by the federal bureau of statistics, reveals the fact that from 1910 to 1939, inclusive, the value of the wheat, oats, barley, rye, flax and mixed grains produced in the prairie provinces totalled \$11,130,257,000 divided as follows:

Manitoba	\$ 2,240,771,000
Saskatchewan	5,860,462,000
Alberta	3,029,024,000
Total	\$11,130,257,000

Of the 80 million acres of improved farm land in Canada, 57 million are in the prairie provinces. Each year the west devotes about 40 million acres to field crops and the east 17 million. Of the 25,800,000 acres devoted to wheat in Western Canada each year, the production from 17 million acres must find an outlet in export markets. Add to that total the acreage summer-fallowed each year and the acreage utilized for the production of other farm products which must find a market outside of Canada and the grand total will be around 80 million acres. Thus nearly one-third of Canada's total farm area is engaged in producing for export markets. The bulk of that area is wheat land.

In an address delivered in Toronto in 1935, E. W. Beatty, president of the Canadian Pacific Railway, said:

"Wheat has played a greater part than any other commodity in creating the vast system of commerce on which modern civilization depends. Were international trade in wheat to vanish or even to shrink considerably, the entire transportation and commerce of the world would suffer a shock of great severity."

The greatest disaster the west has encountered was the fall in the prices of farm products, coinciding with the depression period, which started in 1930. Professor E. C. Hope, of the department of farm management, University of Saskatchewan, in the course of an address delivered at the Bracken Conference in December, 1938, said that if the average annual farm cash income in the west had been the same in the years from 1930 to 1938 inclusive, as in the years from 1926 to 1929, inclusive, the farmers' cash returns would have been \$2,700 million more than they actually had received. In other words, the farmers suffered a decline in cash income of approximately \$300 million a year. This huge "wage cut" is the true cause of the serious economic situation in Western Canada, the unemployment in the cities, and the accumulation of unpaid taxes and debts. The submission of the Province of Saskatchewan to the Rowell Commission stated that the farm debt in that province in 1938 averaged \$25 for every acre seeded. The situation was approximately the same in Alberta.

The huge decline in farm income was partially due to poor crops, but mostly to low prices. World prices for wheat and other farm commodities went to very low levels. Western farmers, being so dependent upon world markets, suffered severely as a consequence. Thus the enormous productivity of Western Canada was not sufficient to carry the producers over the period of severe depression.

TRENDS IN WHEAT POOL POLICIES

The Wheat Pool organizations of Manitoba, Saskatchewan and Alberta developed similar policies in the period following the discontinuance of pooling in 1930. The first objective was to induce as large as possible a patronage of Pool elevator systems in order to provide surplus earnings for the repayment of obligations to the provincial governments. The governments of Manitoba, Saskatchewan and Alberta had issued their own bonds to the banks to cover the indebtedness incurred by the respective provincial Pools in 1929-30, and in turn each Pool had issued bonds covering all its assets to its own provincial government for the amount of the debt due.

The Alberta Pool owed a debt of \$1,750,000 on the terminal elevator built at Vancouver as at July 15th, 1931. This obligation had to be met, along with the annual payments of principal and interest to the Alberta government on the 1929 indebtedness. Up to July 15th, 1939, the following payments had been made on the above indebtedness:

Payments to Alberta Government

Principal	\$1,390,500
Interest	2,040,000
Total	<u>\$3,430,500</u>

Payments on Vancouver Terminal Obligation

Principal	\$1,750,000
Interest	320,000
Total	<u>\$2,070,000</u>

It will thus be seen that in the eight years of operation total payments on debt were \$5,500,500.

Besides making very substantial payments on its debts the Alberta Wheat Pool was able to maintain an excellent financial position, showing on July 31st, 1939, an excess of current assets over liabilities of \$3,917,772.50. The Manitoba and Saskatchewan Wheat Pools have also made very good progress in liquidating their liabilities. In the not far distant future the three organizations will have their heavy obligations wiped out.

But the paying off of the indebtedness was not the sole objective of the Wheat Pools. They continued to be an active and powerful force on behalf of agriculture. Largely through their insistence the federal Wheat Board was re-established and the grain producers of Western Canada provided with a measure of government protection.

"The Wheat Pools are prepared to go ahead with the operation of their elevator facilities," said Ben S. Plumer, director of the Alberta Wheat Pool, in a public address. "They are prepared to afford constant protection to grain farmers, to aid in every way possible in the operation of the government Wheat Board, to encourage the farmers to produce the highest quality of wheat possible, and to co-operate heartily in any intelligent move calculated to better the lot of the prairie farmer."

The Wheat Pools refuse to become mere line elevator companies. They sense the revolution which is happening to agriculture throughout the world, wherein the increasing productivity of the farmer has been tending to bankrupt him through price debacles. The Pool leaders have continually maintained that better prices must be obtained for agricultural production and that if orthodox marketing methods will not provide prices which will furnish some profit to the producers some other system will have to be inaugurated.

The delegate bodies control the Wheat Pools' policies. With a few exception these delegates are working farmers and their interests lie largely in seeing that Pool elevators give service and protection to patrons.

Furthermore, all three Wheat Pool organizations have conducted energetic educational programs on behalf of the co-operative movement in general. They believe that the development of strong co-operative institutions in Western Canada is necessary to provide the farmers protection against exploitation.

The maintenance of the federal Wheat Board is a chief concern of the Pool organizations. The federal government has from time to time shown an inclination to abolish the Board or make it a mere standby organization. The Pools are anxious to see that it is continued in active operation each and every year.

CANADIAN FARM POLICY

There is an increasing conviction among farmers and farm leaders that Canadian farm policies are antiquated and that a new governmental outlook is necessary to solve the problem of agriculture. That problem lies in the fact that, while more than three million of the population live on farms, agriculture receives less than 10 per cent of the national income, and its share has rapidly declined during the past ten years. The major problems of the Canadian economy as they revealed themselves in the past decade must be approached through a restoration of agricultural income and a marked expansion in terms of the national income.

Besides the three million Canadians living on farms there are another two million living in rural areas, whose livelihood depends almost directly on agriculture. Thus, when agriculture's existence is imperilled by low prices, five million Canadians suffer jointly. When that number of people lack sufficient buying power to purchase manufactured goods produced in towns and cities, is it any wonder that unemployment has been rife in industrial areas, the normal interchange of goods between town and country becomes impossible and the farm price level breaks down?

Canada's first duty is to find a means of securing a "living wage" to those engaged in the natural industries, of which farming is the foremost, to cultivate and safeguard their buying power in order that they may become a great and growing market for the production of the secondary industries of the nation.

Farmers do not want the wages and living standards of the people in the cities to be cut down. They prefer to see urban populations with plenty of money to spend. But farmers do want their own living standards raised, and that can only be brought about by the maintenance of prices of farm products. A way must be found to raise farm prices to equitable levels balanced against the fixed charges of labor, of services and of industry.

The farmer has learned to produce abundantly. One hundred years ago it took the efforts of 90 per cent of the population, busily employed on farms, to feed and clothe the nation. Today 25 per cent of that population can easily do the job. The farming population will never be satisfied to have its productivity used as a club to beat down prices to penurious levels. Ways and means must be found to protect the price level of farm products if the nation is to escape persistent depression periods.

HARVEST TIME OF THE WORLD

The following shows the month of the wheat harvest in the wheat growing sections of the world:

JANUARY—Australia, New Zealand and Chili.

FEBRUARY, MARCH—East India, Upper Egypt.

APRIL—Lower Egypt, Syria, Cyprus, Persia, Asia Minor, India, Mexico and Cuba.

MAY—Algeria, Central Asia, China, Japan, Morocco, Texas, Florida.

JUNE—Turkey, Greece, Italy, Spain, Portugal, South of France, California, Louisiana, Mississippi, Alabama, Georgia, Carolinas, Tennessee, Virginia, Kentucky, Kansas, Arkansas, Utah, Missouri.

JULY—Roumania, Bulgaria, Austria, Hungary, South of Russia, Germany, Switzerland, France, South of England, Oregon, Nebraska, Minnesota, Wisconsin, Colorado, Washington, Iowa, Illinois, Indiana, Michigan, Ohio, New York, New England and Ontario, Canada.

AUGUST—Belgium, Holland, Great Britain, Denmark, Poland, Quebec, Canada, Columbia, Western Canada, North and South Dakota.

SEPTEMBER AND OCTOBER—Scotland, Sweden, Norway and North of Russia.

NOVEMBER—Peru, South Africa, and Argentine.

DECEMBER—Burmah and Argentine.

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PERCENTAGES OF MOISTURE ALLOWED IN STRAIGHT, TOUGH OR DAMP GRAIN

	Straight Grade	Tough	Damp
Wheat	Up to 14.5%	Over 14.5% to 17%	Over 17%
Oats	Up to 14.0%	Over 14.0% to 17%	Over 17%
Barley	Up to 14.8%	Over 14.8% to 17%	Over 17%
Rye	Up to 14.0%	Over 14.0% to 17%	Over 17%
Flax	Up to 10.5%	Over 10.5% to 13.5%	Over 13.5%



CANADIAN WHEAT STATISTICS

YEAR	ACREAGE (million acres)	YIELD PER ACRE
Average 1909-13	10.0	16.8
1922-26	22.0	17.6
1927-31	21.6	17.0
1932-36	25.4	11.8
1922-36	24.3	15.1
1922	22.4	17.8
1923	21.9	21.7
1924	22.1	11.9
1925	20.8	19.0
1926	22.9	17.8
1927	22.5	21.4
1928	24.1	23.5
1929	25.3	12.1
1930	24.9	16.9
1931	26.4	12.2
1932	27.2	16.3
1933	26.0	10.8
1934	24.0	11.5
1935	24.1	11.7
1936	25.6	8.6
1937	25.6	7.1
1938	25.9	14.2
1939	26.7	18.3

Bureau of Statistics, Ottawa.

VALUE OF GRAIN PRODUCTION IN ALBERTA

For the Years 1910-39, Inclusive

(000 omitted)

Year	Wheat	Oats	Barley	Rye	Flax	Mixed Grains
1910	\$ 6,251	\$ 5,152	\$ 942	\$ 61	\$ 147	\$ 17
1911	22,544	16,530	1,786	240	1,337	35
1912	18,459	16,231	2,039	211	1,557	39
1913	21,009	17,170	1,964	183	1,374	25
1914	26,403	23,972	2,451	238	645	31
1915	58,325	29,090	2,441	338	1,675	45
1916	86,600	47,011	8,939	418	1,389	47
1917	91,941	54,361	10,178	949	2,720	747
1918	45,604	44,036	7,523	1,165	1,498	692
1919	79,945	42,064	11,512	1,666	921	783
1920	126,861	41,433	7,898	4,275	1,329	252
1921	10,756	15,406	3,730	1,239	219	60
1922	50,031	12,132	2,620	3,103	135	148
1923	91,143	27,595	4,889	3,056	254	113
1924	73,575	22,653	7,285	2,662	106	209
1925	116,735	18,758	4,836	599	148	47
1926	119,689	21,814	3,841	934	125	134
1927	168,003	44,510	6,960	2,436	323	252
1928	128,511	33,538	7,419	2,075	92	188
1929	94,385	20,129	6,257	1,906	140	233
1930	51,831	11,691	2,660	557	318	95
1931	50,647	16,290	4,368	242	144	113
1932	53,551	13,195	3,152	426	118	102
1933	46,050	13,050	2,812	236	51	97
1934	65,250	20,250	5,866	569	114	139
1935	60,175	13,152	3,766	399	104	84
1936	60,720	217,500	10,880	564	181	157
1937	77,214	26,950	9,945	770	186	140
1938	85,956	15,150	5,840	648	275	106
1939	75,000	15,300	7,020	784	476	139
	<u>\$2,096,137</u>	<u>\$716,413</u>	<u>\$159,852</u>	<u>\$33,249</u>	<u>\$18,101</u>	<u>\$5,272</u>

GRAND TOTAL\$3,029,024,000

YEARLY AVERAGE PRICES OF NO. 1 NORTHERN WHEAT **Fort William - Port Arthur Basis, Crop Years,** **1890-91 to 1939-40**

Crop Year Ending August 31.	Cents per bushel.	Crop Year Ending August 31.	Cents per bushel.
1890-91.....	90.4	1907-08.....	104.7
1891-92.....	87.0	1908-09.....	116.1
1892-93.....	74.9	1909-10.....	102.4
1893-94.....	65.6	1910-11.....	96.6
1894-95.....	71.0	1911-12.....	100.8
1895-96.....	61.1	1912-13.....	89.4
1896-97.....	72.6	1913-14.....	89.4
1897-98.....	98.9	1914-15.....	132.4
1898-99.....	72.4	1915-16.....	113.3
1899-1900.....	69.8	1916-17.....	205.6
1900-01.....	79.5	1917-18.....	221.0
1901-02.....	72.7	1918-19.....	221.1
1902-03.....	74.9	1919-20.....	217.5
1903-04.....	86.2	1920-21.....	199.3
1904-05.....	97.4	1921-22.....	129.7
1905-06.....	77.5	1922-23.....	110.5
1906-07.....	79.5	1923-24.....	107.1
Crop Year Ending July 31	Cents per bushel.	Crop Year Ending July 31	Cents per bushel.
1921-25.....	169.0	1933-34.....	68.1
1925-26.....	151.2	1934-35.....	81.8
1926-27.....	146.3	1935-36.....	85.1
1927-28.....	146.3	1936-37.....	122.7
1928-29.....	124.0	1937-38.....	131.0
1929-30.....	124.0	1938-39.....	63.6
1930-31.....	64.2	1939-40 first six months.....	72.2
1931-32.....	59.8		
1932-33.....	54.3		

—Bureau of Statistics, Ottawa.

ALBERTA'S WHEAT CROPS **For 30 Years**

Year	Bushels	Valued at \$	Yield Per Acre	Acreage
1910.....	9,060,210	6,254,000	10.3	879,301
1911.....	36,602,000	22,544,000	22.32	1,639,971
1912.....	34,303,000	18,459,000	21.5	1,590,000
1913.....	34,372,000	21,009,000	22.7	1,512,000
1914.....	28,859,000	26,403,000	21.0	1,371,160
1915.....	66,538,000	58,325,000	31.12	2,138,031
1916.....	65,088,000	86,690,000	24.9	2,604,975
1917.....	52,992,000	91,941,000	18.2	2,897,300
1918.....	23,752,000	45,604,000	6.0	3,892,489
1919.....	34,575,000	79,945,000	8.0	1,282,503
1920.....	83,461,000	126,861,000	20.5	4,074,483
1921.....	53,044,000	40,756,000	10.3	5,123,401
1922.....	61,976,000	50,031,000	11.3	5,765,595
1923.....	144,834,000	94,143,000	28.0	5,172,613
1924.....	61,312,000	73,575,000	11.0	5,573,813
1925.....	97,962,000	116,735,000	18.3	5,347,972
1926.....	113,986,000	119,686,000	18.5	6,161,383
1927.....	171,286,000	168,003,000	27.4	6,251,000
1928.....	171,000,000	128,511,000	25.5	6,707,526
1929.....	92,534,000	94,385,000	12.3	7,551,215
1930.....	147,000,000	51,831,000	20.5	7,164,000
1931.....	140,603,000	50,617,000	17.7	7,938,000
1932.....	164,000,000	53,554,000	20.0	8,201,000
1933.....	102,334,000	46,050,000	13.0	7,898,000
1934.....	112,500,000	65,250,000	15.0	7,501,000
1935.....	102,000,000	60,175,000	13.6	7,500,000
1936.....	66,000,000	60,720,000	8.8	7,537,200
1937.....	75,700,000	77,214,000	9.7	7,834,000
1938.....	148,200,000	85,956,000	18.6	7,969,000
1939.....	150,000,000	75,000,000	17.9	8,379,000
	2,648,873,210	\$2,096,137,000		

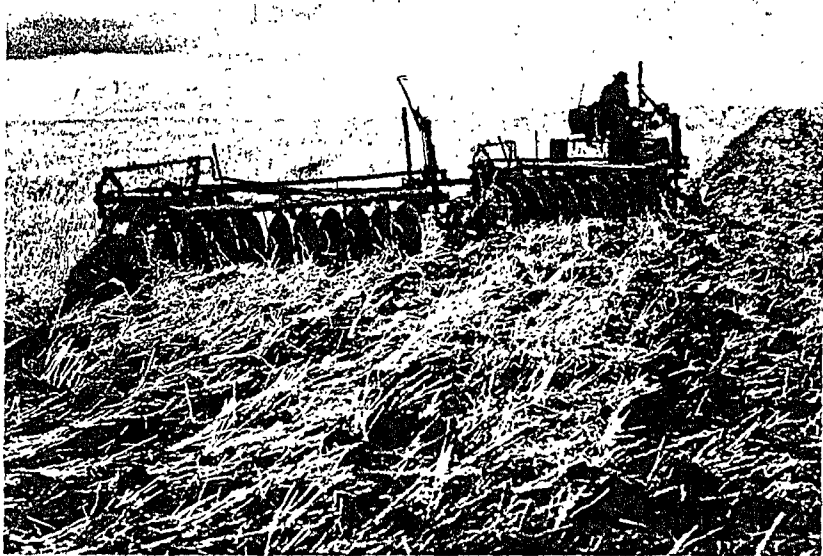
PRODUCTION AND DISTRIBUTION OF WHEAT IN CANADA, 1870-71 to 1939-40

Crop Year	Estimated Population	Production Bus.	Exports Wheat & Flour Bus.	Apparent Home Consumption Bus.
1870-71	3,625,000	16,724,000	3,127,503	23,563,000
1880-81	4,255,000	32,350,000	4,502,449	28,813,000
1890-91	4,779,000	42,223,000	3,443,744	39,185,000
1891-92	4,833,000	60,721,000	10,428,636	50,523,000
1892-93	4,883,000	48,182,000	11,117,718	37,229,000
1893-94	4,931,000	41,347,000	11,200,953	30,353,000
1894-95	4,979,000	43,221,000	9,829,077	34,107,000
1895-96	5,026,000	45,703,000	10,759,764	45,272,000
1896-97	5,074,000	39,570,000	9,753,185	30,019,000
1897-98	5,122,000	54,418,000	24,585,578	30,051,000
1898-99	5,175,000	66,495,000	13,871,882	52,919,000
1899-1900	5,235,000	59,912,000	20,301,379	39,866,000
1900-01	5,301,000	55,572,000	14,773,908	41,113,000
1901-02	5,371,000	88,337,000	31,007,446	57,090,000
1902-03	5,494,000	97,073,000	38,780,692	58,536,000
1903-04	5,651,000	81,888,000	23,923,228	58,186,000
1904-05	5,827,000	71,838,000	20,646,926	51,474,000
1905-06	6,002,000	107,033,000	47,293,465	59,993,000
1906-07	6,097,000	135,602,000	46,465,868	89,370,000
1907-08	6,411,000	93,131,000	47,583,514	45,851,000
1908-09	6,625,000	112,434,000	56,733,636	55,879,000
1909-10	6,800,000	166,714,000	67,808,093	99,145,000
1910-11	6,988,000	132,078,000	62,398,113	70,088,000
1911-12	7,207,000	231,237,000	97,600,903	134,012,000
1912-13	7,389,000	224,159,000	115,744,172	109,304,000
1913-14	7,632,000	231,717,000	135,587,447	96,487,000
1914-15	7,879,000	161,280,000	86,750,125	76,710,000
1915-16	7,981,000	393,513,000	269,157,743	124,690,000
1916-17	8,001,000	262,781,000	174,565,250	88,520,000
1917-18	8,060,000	233,743,000	169,240,340	64,784,000
1918-19	8,148,000	189,075,000	96,960,401	92,436,000
1919-20	8,311,000	193,260,000	92,499,554	100,962,000
1920-21	8,556,000	226,508,000	167,215,443	59,747,000
1921-22	8,788,000	309,858,000	185,769,679	168,759,000
1922-23	8,919,000	399,786,000	279,364,980	129,719,000
1923-24	9,010,000	474,199,000	346,521,561	94,650,000
1924-25	9,143,000	262,097,000	192,721,772	87,451,000
1925-26	9,294,000	395,475,000	324,592,021	62,501,000
1926-27	9,451,000	407,136,000	292,880,996	100,191,000
1927-28	9,637,000	479,665,000	332,963,283	120,172,000
1928-29	9,835,000	566,726,000	407,564,187	133,805,000
1929-30	10,029,000	304,520,000	186,267,210	111,943,000
1930-31	10,208,000	420,672,000	258,693,887	139,487,000
1931-32	10,376,000	321,325,000	207,029,555	117,560,000
1932-33	10,506,000	443,061,000	264,304,327	99,123,000
1933-34	10,681,000	281,892,000	194,779,875	104,518,000
1934-35	10,824,000	275,849,000	165,751,305	101,583,000
1935-36	10,935,000	281,935,000	254,424,775	121,702,000
1936-37	11,028,000	219,218,000	195,223,653	99,542,000
1937-38	11,120,000	180,210,000	92,957,047	103,562,000
1938-39	11,209,000	360,010,000	166,959,447	113,217,000
1939-40		489,623,000		

WORLD WHEAT STATISTICS World Wheat Supplies and Approximate Disappearance, Annually from 1925-26

Crop Year*	Carryover As At Aug. 1	Crops (Million Bushels)	U.S.S.R. Exports	Total Supplies	Disappearance
1925-26	475	3,415	27	3,917	3,371
1926-27	546	3,523	50	4,119	3,529
1927-28	590	3,705	2	4,297	3,646
1928-29	651	4,037		4,688	3,777
1929-30	911	3,607	9	4,527	3,653
1930-31	874	3,881	114	4,869	3,944
1931-32	925	3,873	65	4,863	3,912
1932-33	951	3,874	17	4,842	3,724
1933-34	1,118	3,810	34	4,962	3,774
1934-35	1,188	3,490	2	4,680	3,740
1935-36	940	3,557	29	4,526	3,768
1936-37	758	3,508	5	4,271	3,753
1937-38	518	3,788	43	4,349	3,762
1938-39	587	4,605	34	5,192	4,036
1939-40	1,101	4,267		5,368	

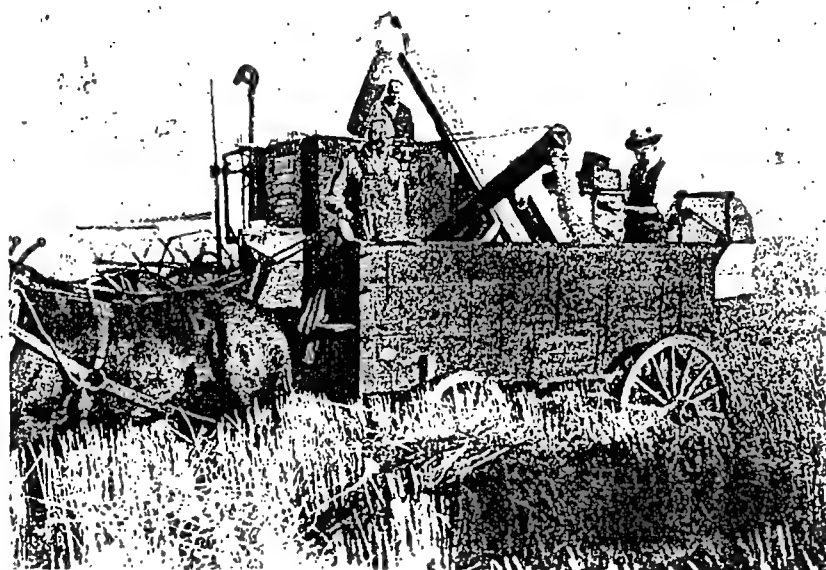
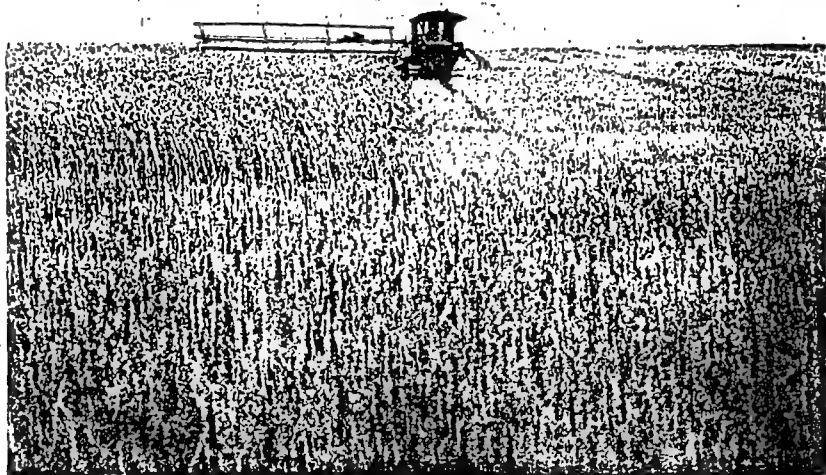
*A crop year is from August 1st to the following July 31st.



Alberta Farming Scenes.

Above: Tiller plows working on stubble.

Below: Harvest scene.



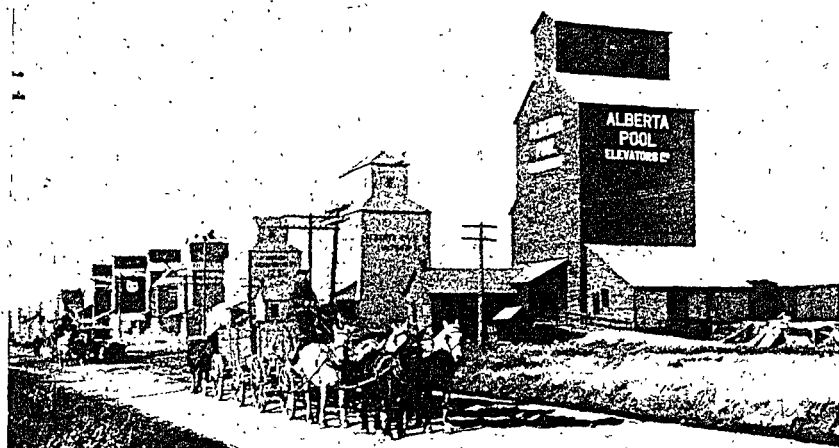
Harvest scenes in Alberta — Combines in operation.



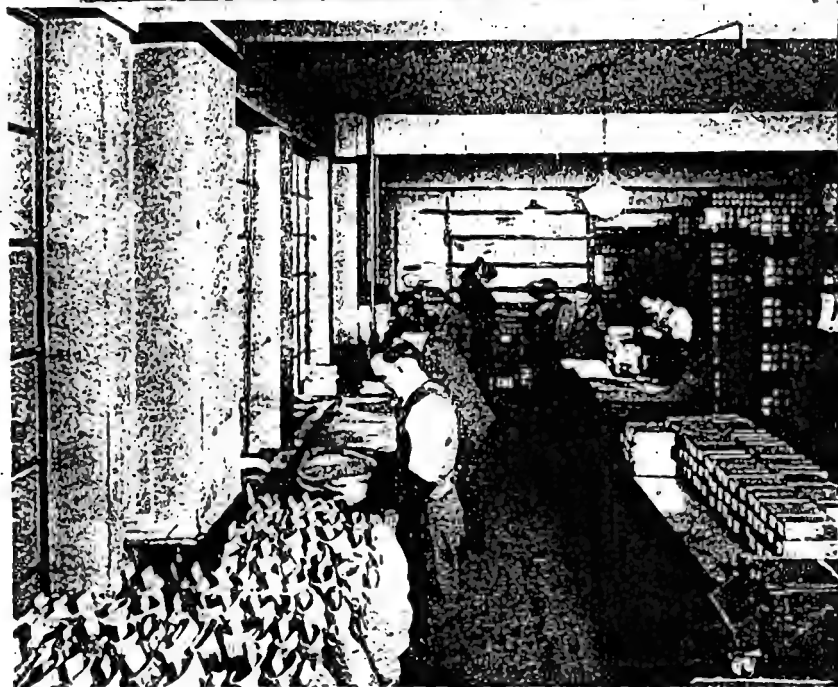
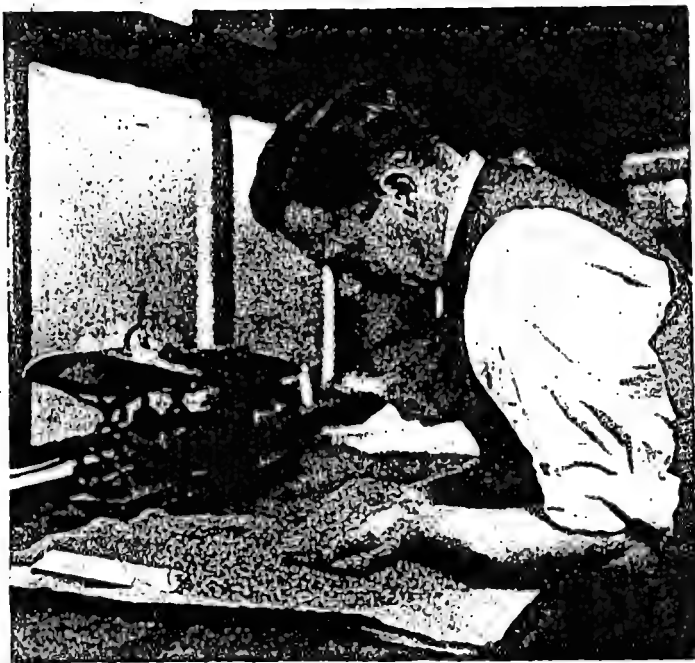
Alberta Junior Wheat Clubs, sponsored by the Provincial Dept. of Agriculture and the Alberta Wheat Pool, do a useful work in training boys to grow good seed.



Above: Unloading grain in a country elevator.
Below: Government official probing car for grading.

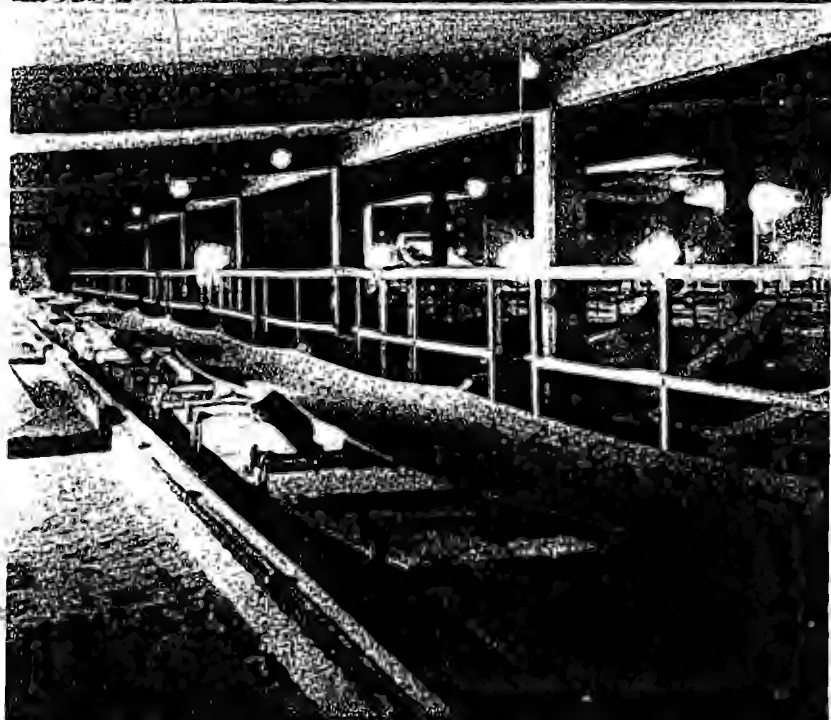


Alberta Pool Elevators.



Above: Government grader at work.

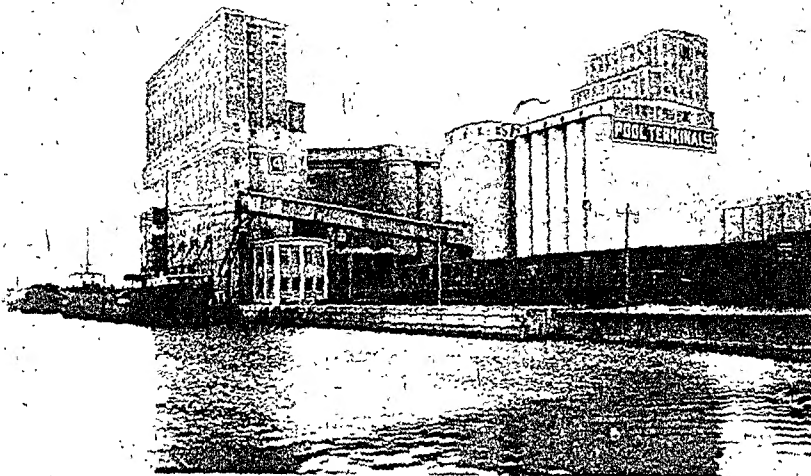
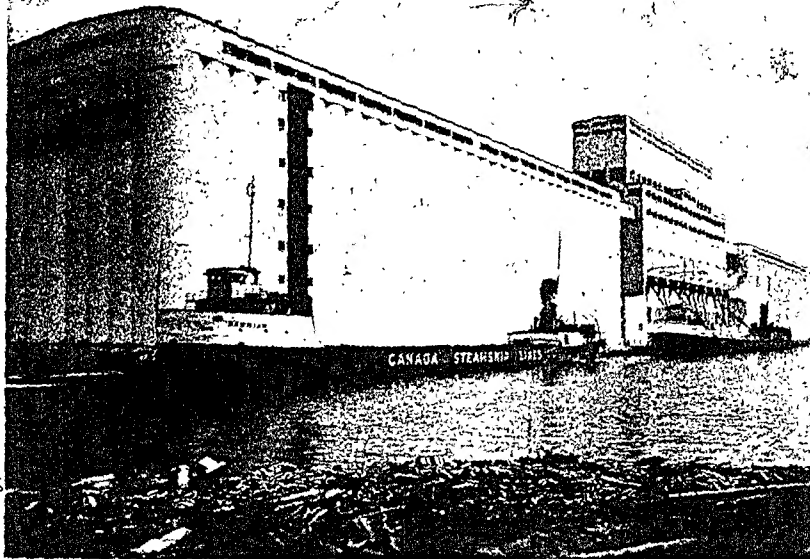
Below: Government officials test grain for dockage.



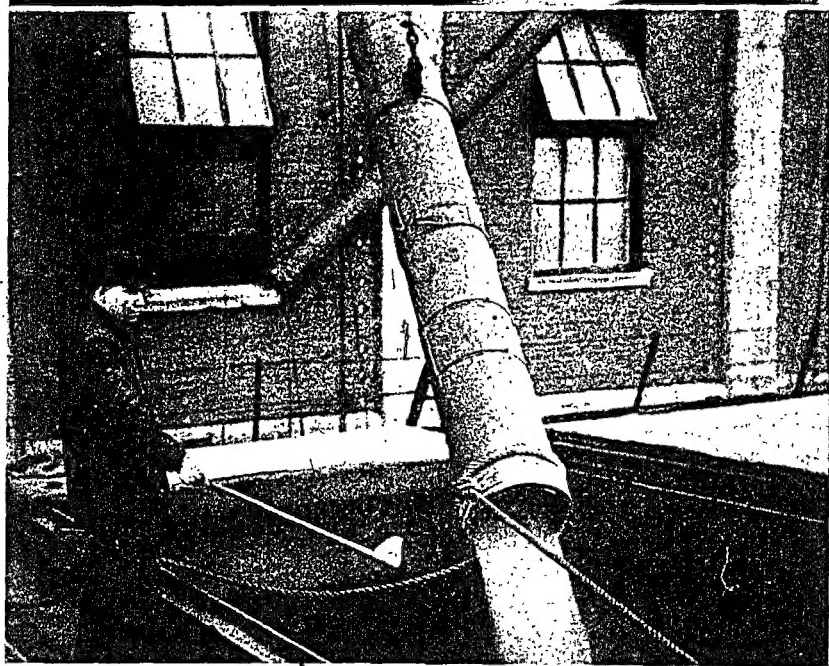
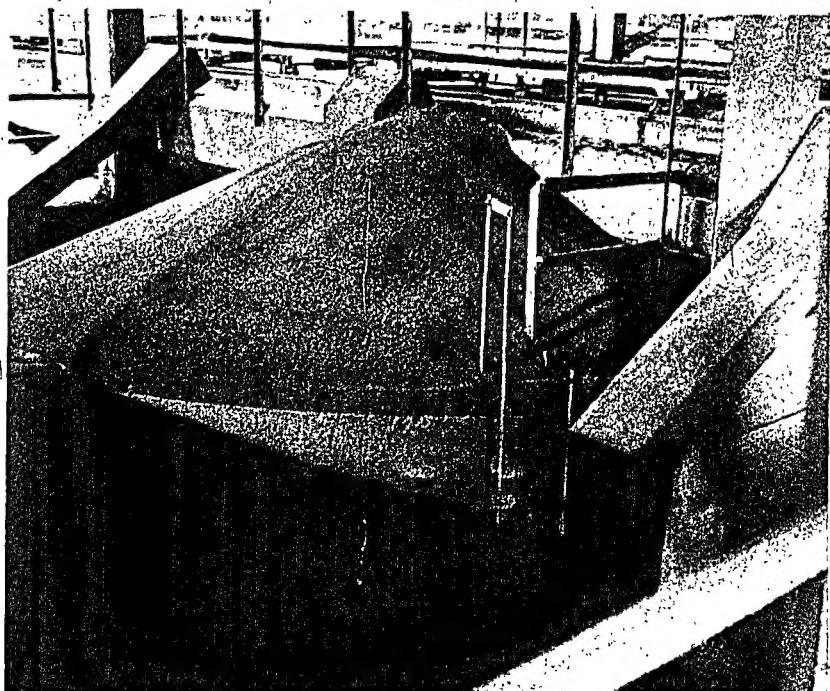
Above: Alberta Pool Terminal at Vancouver.

Below: Huge leather belts carry the grain in terminal elevators.

Sask. Pool Terminal No. 7
Capacity 7,200,000 Bus
Port Arthur, Ont.

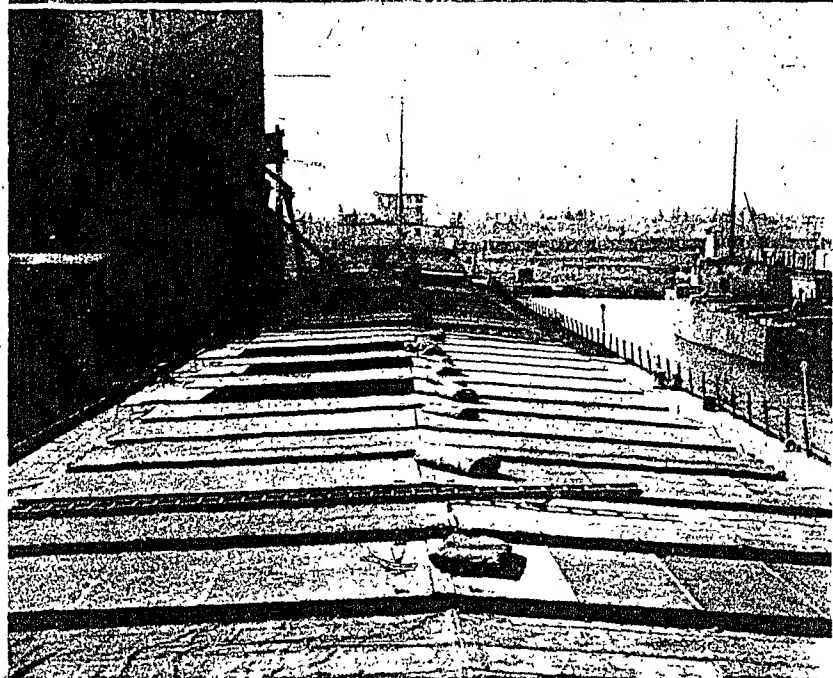
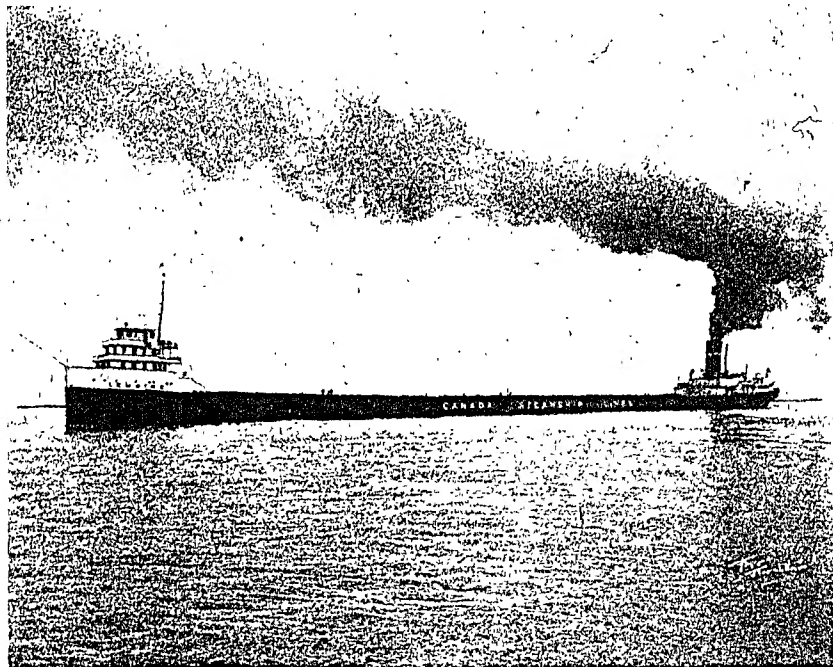


Below: Saskatchewan Pool Terminal No. 4, Port Arthur;
 Capacity, 6,425,000 bushels.



Above: A terminal elevator bin full of wheat.

Below: Spouting wheat from a terminal elevator into a steamer's hold.



Above: A Great Lakes grain freighter.
Below: Loading a lake boat at Port Arthur.



Above: Welland Ship Canal, Pt. Weller Harbour, lower end Lock No. 1.
 Below: Welland Ship Canal, Vessels in Pt. Dalhousie Harbour waiting
 passage through present canal.